S/078/61/006/011/008/013
B101/B147

AUTHORS: Morozov, I. S., Toptygina, G. M., Lipatova, N. P.

TITLE: Thermographic and X-ray analyses of compounds formed from titanium trichloride with chlorides of alkali metals and ammonium chloride

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 11, 1961, 2536-2544

TEXT: In a previous paper (Zh. neorg. khimii, 6, 2528 (1961)), the authors synthesized the pentachloro aquotitanates of Cs, Rb, NH_4, and K. In the present paper, they report on 1) the synthesis of pentachloro titanates of Cs, Rb, NH_4, and K; 2) the powder patterns of pentachloro aquotitanates and pentachloro titanates, and 3) the thermal analysis of these compounds with Kurnakov's pyrometer. Results: 1) The temperatures at which aquo compounds separate H_2O are: 270°C for $Cs_2TiCl_5H_2O$, 212°C for $Rb_2TiCl_5H_2O$, 116°C for $(NH_4)_2TiCl_5H_2O$, and 112°C for $K_2TiCl_5H_2O$. The compounds Cs_2TiCl_5, Rb_2TiCl_5, $(NH_4)_2TiCl_5$, and K_2TiCl_5

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Thermographic and X-ray analyses of...

were obtained by 6-8 hr heating in HCl stream under slow temperature elevation from 250 to 350°C with the Cs compound, from 200 to 300°C with the Rb compound, and from 100 to 150°C with the NH_4 and K compounds. The light-green color of the initial compounds changed: into olive-green with Cs and Rb compounds, and gray with the K compound. The NH_4 compound remained light-green. 2) The powder patterns of these compounds are shown in Fig. 1. They differ from those of pentachloro aquotitanates, which are also given. Lines of components do not occur in either of the two powder patterns. The X-ray data of K_2TiCl_5 differ from those of P. Ehrlich et al. (Z. anorg. Chem. 299, 213 (1959)) obtained by another method of synthesis. X-ray analysis reveals that the crystal structure is changed by removing H_2O from inside the coordination sphere of the complex whereas the skeleton formed by heavy atoms remains almost unchanged. Ti has the coordination number 6. 3) Due to the low stability of the compounds, the thermographic analysis was conducted in an inert gas stream. It showed: (a) that all aquotitanates separated water at the given temperature. At a further temperature elevation, interaction

Card 2/13

between free H_2O and Ti compounds caused side reactions by which deciphering of the thermographs was rendered difficult. (b) Pentachloro titanates have two phases, one of which, $TiCl_3$, is disproportionated into $TiCl_2$ and $TiCl_4$. NH_4 of the NH_4 compound is decomposed, and titanium nitride forms. A paper by M. V. Kamenetskiy (Tsvetnyye metally, 2, 39 (1958)) is mentioned. V. G. Kuznetsov is thanked for advice, and Z. V. Popova for assisting with the X-ray analysis. There are 2 figures, 3 tables, and 25 references: 12 Soviet and 13 non-Soviet. The three most recent references to English-language publications read as follows: K. Komareck, P. Herasymenko. J. Electrochem. Soc., 105, 216 (1958); F. V. Schossberger. Ind. Eng. Chem., 51, 157 (1959); H. P. Klug, E. Kummer, A. Leroy. J. Amer. Chem. Soc., 70, 3064 (1948).

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: February 24, 1961

Card 3/3

TOPTYGINA, G. M.

Cand Chem Sci - (diss) "Physico-chemical study of the reaction of titanium chlorides with chlorides of alkali metals and ammonium chloride in acid-salt medium." Moscow, 1961. 13 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow State Univ imeni M. V. Lomonosov, Chemistry Faculty); 200 copies; price not given; (KL, 10-61 sup, 208)

MOROZOV, I.S.; TOPTYGINA, G.N.

Hydrochloric acid solutions of titanium chlorides. Zhur.neorg. khim. 2 no.7:1629-1638 Jl '57. (MIRA 10:11)
(Titanium chlorides) (Hydrochloric acid)

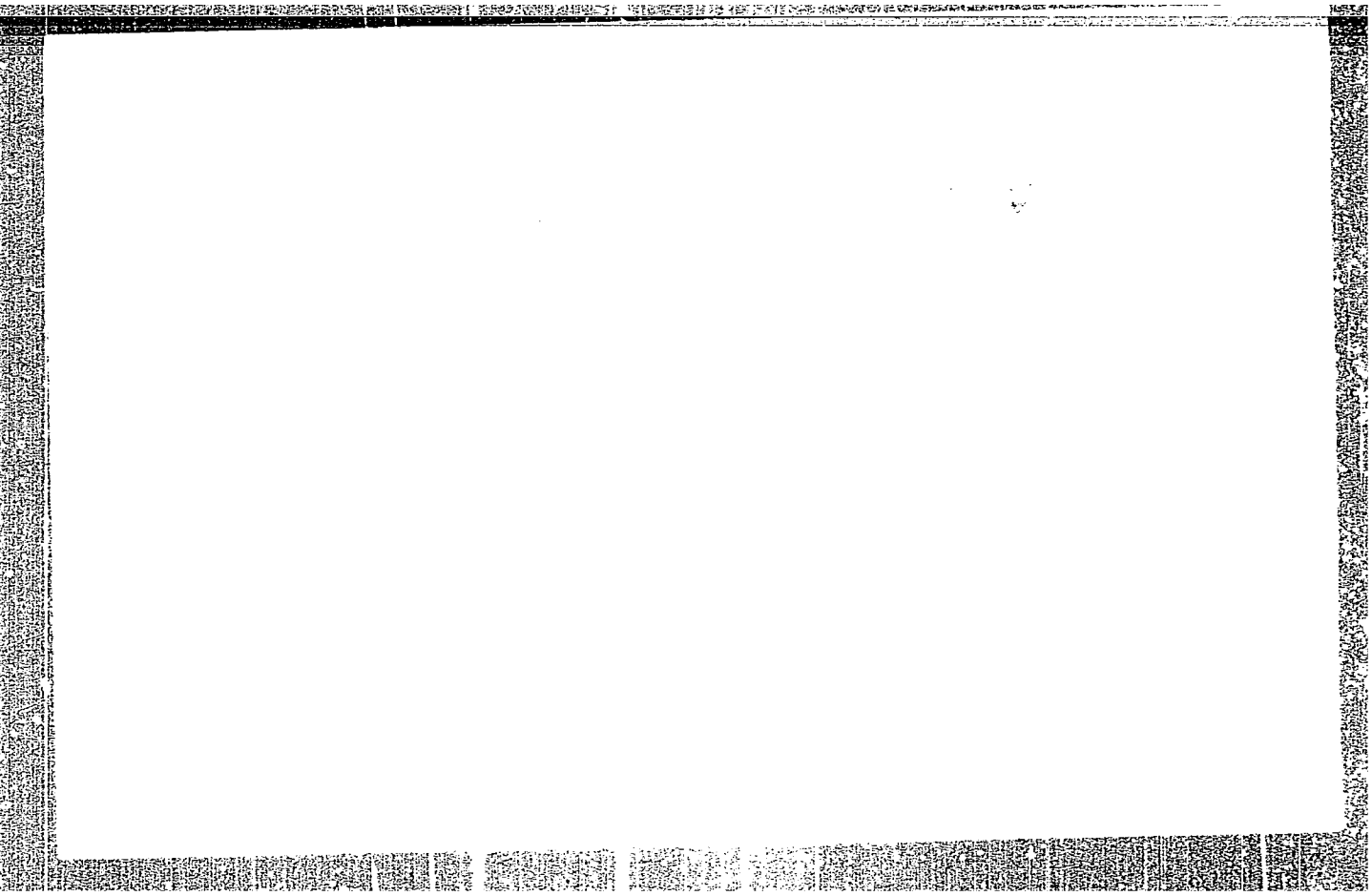
TOPTYGINA, Nadezhda Illarionovna; MASHINA, O.K., red.; BEYSHENOV, A., tekhn. red.

[Leninist principle of mutual asistance is the basic feature of the development of Soviet peoples]Leninskii printsip vzaimopomoshchi - osnova razvitiia sovetskikh narodov. Frunze, Kirgizskoe gos. izd-vo, 1962. 34 p. (Besedy o XXII s"ezde KPSS) (MIRA 15:7)

(Kirghizistan—Economic conditions)

MOROZOV, I.S.; TOPTYGIN, D.Ya.

Physicochemical principles of titanium tetrachloride purification processes. Titan i ego splavy no.4:102-114 '60. (MIRA 13:11)
(Titanium chloride) (Thermal analysis)
(Vapor-liquid equilibrium)



APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001756320003-4"

SOV/56-35-3-41/61

16(1)

AUTHORS: Dolginov, A. Z., Toptygin, I. N.

TITLE: The Expansion of Clebsch-Gordan for Infinite-Dimensional Representations of the Lorentz Group (Razlozheniye Klebsha-Zhordana dlya beskonechnomernykh predstavleniy gruppy Lorentsa)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 3, pp 794-796 (USSR)

ABSTRACT: A. Z. Dolginov deduced the explicit form of the Clebsch (Klebsh)-Gordan (Zhordan) coefficients for the expansion of finite-dimensional representations of the Lorentz (Lorents) group. An explicit expression of this expansion is given. By a certain substitution in this expression, the basic functions of one of the irreducible unitary infinite-dimensional representations of the Lorentz group may be deduced. These basic functions $\psi_{nlm}(\alpha,\vartheta,\varphi)$ are orthogonal and normalized. The authors then deduce the Clebsch-Gordan expansion for the functions ψ_{nlm}, and they give recurrence formulae for ψ_{nlm}. Formulae are given also for the inverse

Card 1/2

SOV/56-35-3-41/61

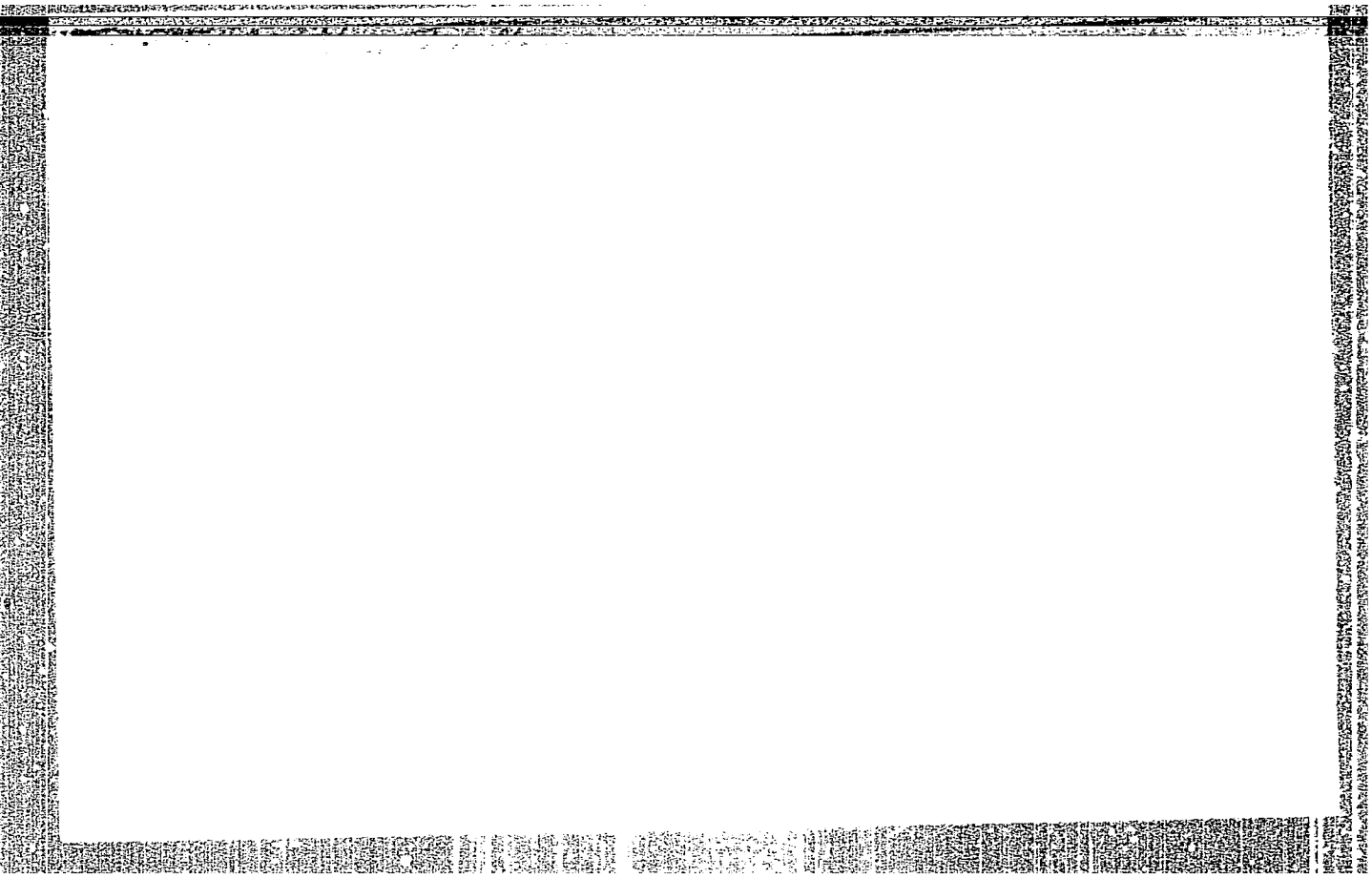
The Expansion of Clebsch-Gordan for Infinite-Dimensional Representations of the Lorentz Group

Clebsch-Gordan series and for the expansion of the derivatives of Φ_{nlm} with respect to irreducible representations. There are 2 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Leningrad Physico-Technical Institute of the Academy of Sciences, USSR)

SUBMITTED: May 29, 1958

Card 2/2



APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001756320003-4"

DOLGINOV, A.Z.; TOPTYGIN, I.N.

Klebsch-Jordan expansion of infinite-dimensional representations of the Lorentz group. Zhur. eksp. i teor. fiz. 35 no.3:794-736 S '58. (MIRA 12:3)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Groups, Theory of)

TOPTYGIN, I.N.

Multiple scattering of polarized electrons. Zhur.eksp. i teor. fiz. 36 no.2:488-498 F '59. (MIRA 12:4)

1. Leningradskiy politekhnicheskiy institut.
(Electrons--Scattering)

ACCESSION NR: AP4025918 S/0056/64/046/003/0851/0862

AUTHOR: Topty*gin, I. N.

TITLE: Contribution to the theory of bremsstrahlung and pair production in a medium

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 851-862

TOPIC TAGS: bremsstrahlung, pair production, photon and medium interaction, diagram technique, photon absorption contribution, photon scattering contribution, bremsstrahlung probability, photon emission, Compton scattering

ABSTRACT: Interactions between photons and a medium in connection with bremsstrahlung from extremely relativistic electrons are investigated using diagram technique of Konstantinov and Perel' (ZhEFT v. 39, 197, 1960), which is shown to have several advantages over diagramless method and permits construction of a more rigorous theory of these phenomena. The contributions from photon absorption resulting in pair production and from photon scattering on the nuclei are included. It is shown that for electrons of sufficiently high energy the Compton scattering plays an important part in the soft portion of the spectrum by giving rise to an additional term

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ACCESSION NR: AP4025918

in the bremsstrahlung probability, which describes the photon emission by the electrons of the medium, and which predominates over all other terms at photon energies near 10^7 eV and electron energies near 10^5 k. Bremsstrahlung spectrum in this region is described by means of equations derived for the first time and which hold true even when Compton scattering is not neglected. "The author is sincerely grateful to V. V. Baty*gin, A. Z. Dolginov, O. V. Konstantinov, and V. I. Perel' for numerous discussions of many of the problems considered in the present work." Orig. art. has: 51 formulas and 5 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute)

SUBMITTED: 23May63 DATE ACQ: 16Apr64 ENCL: 00

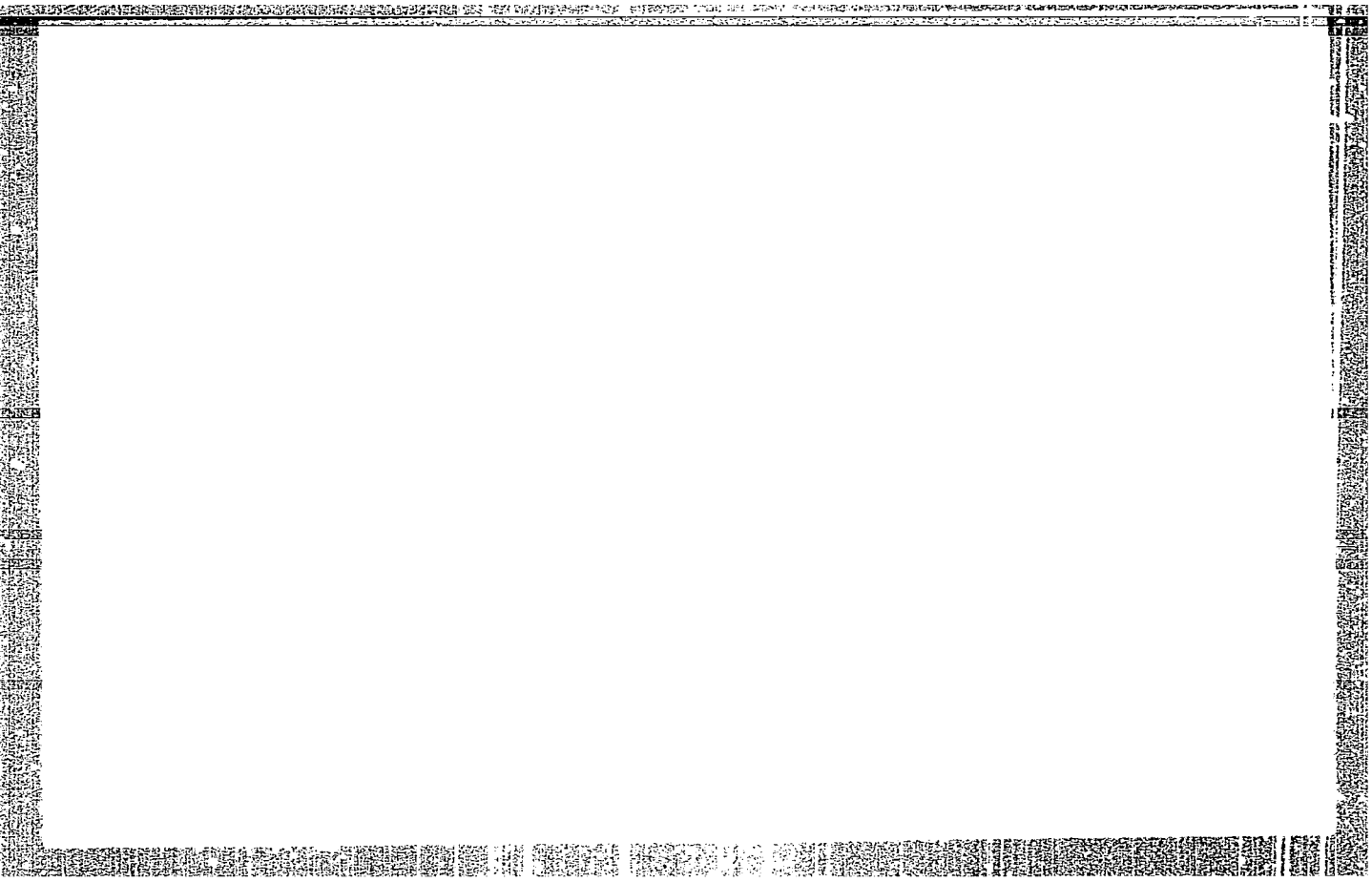
SUB CODE: PH NO REF SOV: 008 OTHER: 004

Card 2/2

TOPTYGIN, I.N.

Theory of positron annihilation in an ionized gas. Zhur.tekh. fiz. 34 no.4:645-653 Ap. '64. (MIRA 17:4)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.



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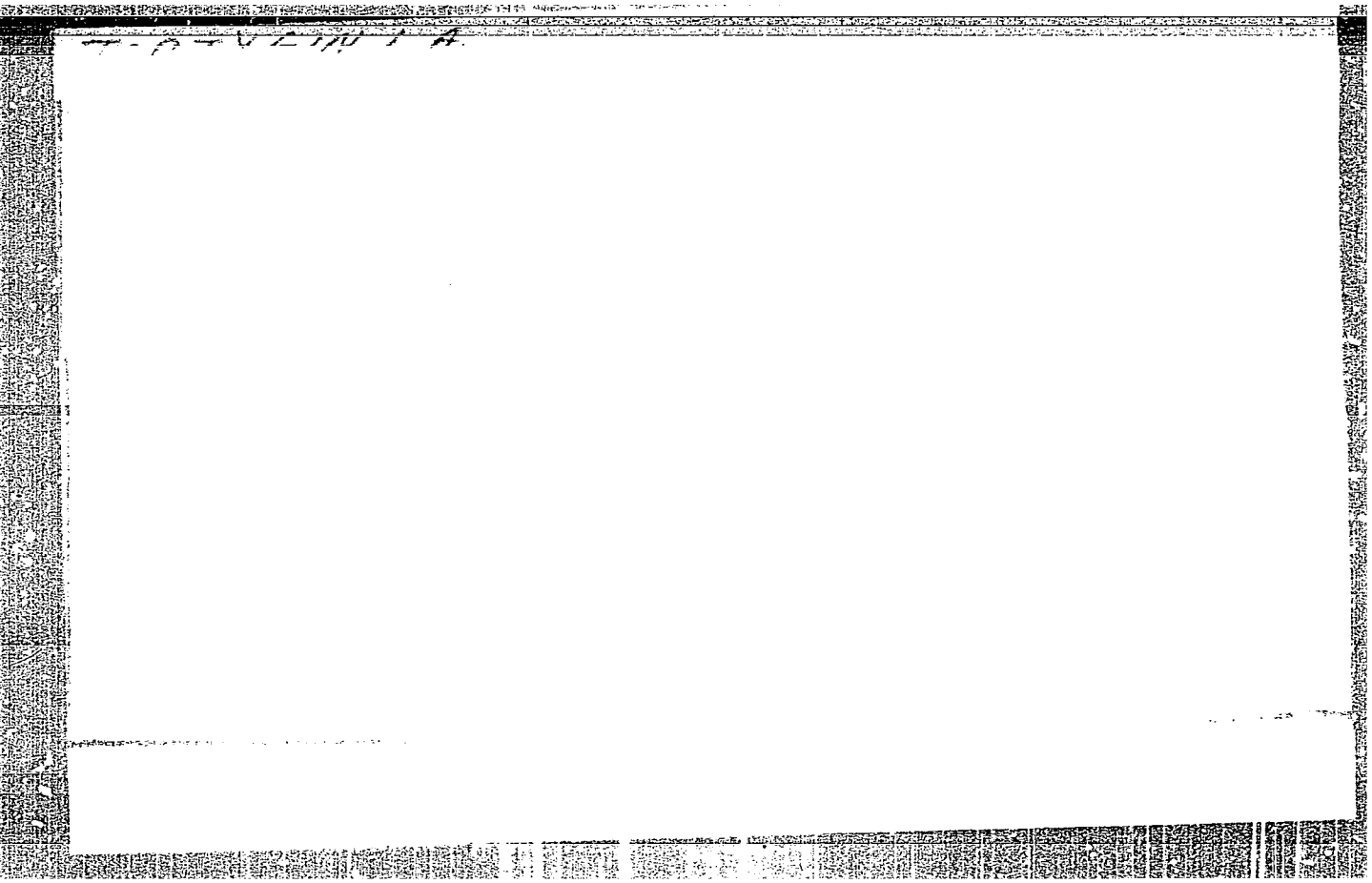


APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001756320003-4"

S/063/60/005/001/003/009

AUTHORS: Tumarkin, L. A., Toptygin, L. A.

TITLE: The Basic Trends in the Automation of Chemical Workshops at Coke-Chemical Plants

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva im. D. I. Mendeleyeva, 1960, Vol. 5, No. 1, pp. 61-67

TEXT: The coke-chemical industry will be automated and mechanized during the next few years. Several measures are proposed in the article. The primary cooling of the coke gas should ensure the reduction of its temperature to 30-35°C under all meteorological conditions. Solid naphthalene will be eliminated from the surface of pipes by heating them automatically to the melting point of naphthalene. The sulfate separation can be automated in the existing equipment by avoiding the periodic dissolution of deposits on the walls of the saturater and installing continuous washing of the inner walls by mother liquor with an acidity of 12-15%. The automation of the benzene-scrubber department should ensure maximum extraction of benzene hydrocarbons. The principal difficulties in this respect are: the presence of many independent variables affecting the process of benzene sorption from coke gas; the deposits of resinous substances

Card 1/3

The Basic Trends in the Automation of Chemical Workshops at Coke-Chemical Plants

on the surface of the heat-exchange and collecting apparatus. The automation of the benzene-scrubber department cannot be realized without improving the quality of the absorbing oil. The supply of steam to the benzene column for distilling the benzene hydrocarbons from the absorbing oil should be controlled automatically. Hydrogen sulfide is collected from coke gas in continuous operations which can be automated easily. An exception is only the absence of an installation for the processing of substances from the solution of sulfur purification which cannot be recovered. A transducer must be developed which should indicate the content of hydrogen sulfide in the solution after regeneration. In the tar distillation workshop the continuous averaging of the different tar grades must be organized. The tar distillation can be automated by a system developed for oil refineries. The accurate separation of anthracene fractions can be solved by automation of the sprinkling of the upper part of the pitch column by the absorbing fraction. A continuous system for the washing of the naphthalene fraction and the processing of the anthracene fraction in continuously operating crystallizers were developed by the Ukrainskiy uglekhimicheskiy nauchno-issledovatel'skiy institut (UKhIN) (Ukrainian Coal-Chemical Scientific Research Institute) and Giprokoks. In the rectification of crude benzene all batch operations, e. g.,

S/063/60/005/001/003/009

The Basic Trends in the Automation of Chemical Workshops at Coke-Chemical Plants

the washing of the benzene fractions by sulfuric acid and the production of toluene, must be eliminated. The neutralization of the benzene vapors must be automated by maintaining a temperature difference of 3-4°C between the liquid alkali and the vapors. Attention must be paid to corrosion-resistance of the materials employed. The automated installations will pay off within 2-2.5 years. There are 4 block diagrams.

Card 3/3

TOPTYGIN, L.A.

68-7-14/16

AUTHORS: Miryan, I.F., Toptygin, L.A. and German, M.Ya. (Cand.Tech.Sc.)

TITLE: The Combustion of Wastes from Coal Beneficiation on Electricity Generating Stations (TETs). (Szhiganiye na TETs otkhodov ugleobogashcheniya).

PERIODICAL: Koks i Khimiya, 1957, Nr 7, pp. 53-58 (USSR)

ABSTRACT: The use of wastes from coal beneficiation plants of ash content about 60% (a mixture of separated rock and washing residues, Table 1) in boilers for generating electricity on the Bageyskiy Coke Oven Works was investigated. The installation is described in some detail (coal dust burner of TKZ-Babkok type). Coke oven gas was used for a supplementary flame. The following problems were studied: 1) the use of waste product containing about 60% ash; 2) conditions necessary to obtain stable combustion of the mixture; 3) the influence of mineral matter and an increase in ash content on slagging in the fire box; 4) determination of optimum degree of fineness; 5) determination of the degree of wear of equipment and in particular of heating surfaces by ash, and 6) technico-economical indices of the use of waste as fuel. Experimental results are given in Table 2. It was found that the efficiency coefficient of the boiler somewhat decreased. Minimum amount of coke oven gas required was 450-600 n m^3/hr

Card 1/2

68-7-14/16

The Combustion of Wastes from Coal Beneficiation on Electricity Generating Stations (TETs).

(about 7-8% of the total heat input). During July 1955 - August 1956, the waste product was used as fuel, but only in April and May 1956 the proportion of waste rocks and washery waste was on the level required. The relevant data for this period are given in Tables 4-6 and a graph. Neither slagging nor excessive wear of heating surfaces and auxiliary equipment was observed. It is concluded that all the waste from the beneficiation of coals can be used as boiler fuel providing it is supplemented with coke oven gas flame. Further study of utilising the above waste but without supplementary gas flame is recommended. There are 6 tables and 1 graph.

ASSOCIATION: Bagley Coke Oven Works and Dnepropetrovsk Institute of Chemical Technology. (Bagleyskiy Koksokhimicheskiy Zavod i Dnepropetrovskiy Khimiko-Tekhnologicheskiy Institut)

AVAILABLE: Library of Congress
Card 2/2

TOPTYGIN, L.A.

Increasing the stability of oils used in power production. (MLRA 10:5)
Koks i khim. no.4:56-58 '57.

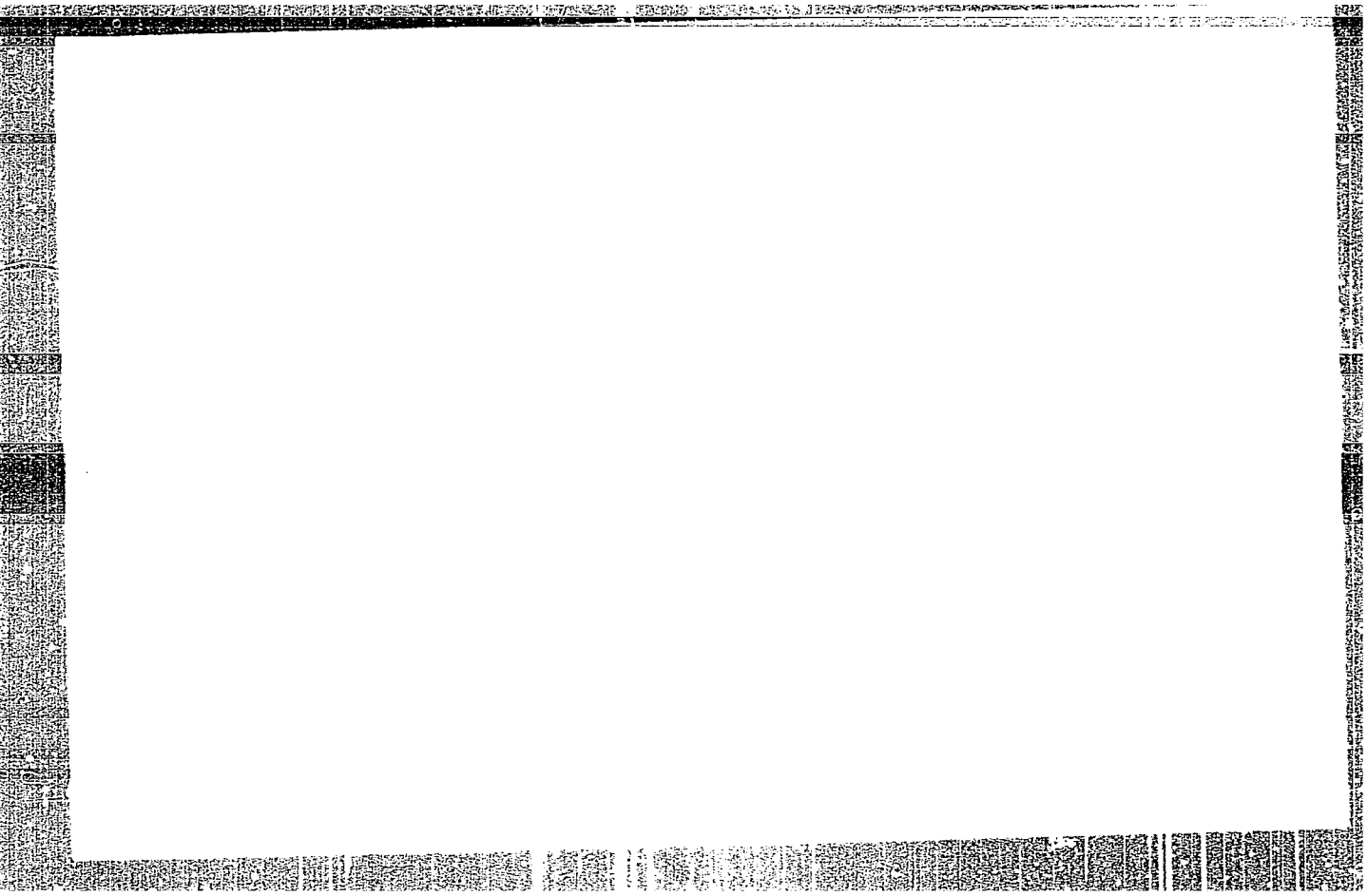
1. Bagleyskiy koksokhimicheskiy zavod.
(Insulating oils) (Oil reclamation)

TOPTYGIN, L. A.

MIRYAN, I.F.; TOPTYGIN, L.A.; GERMAN, M.Ya., kandidat tekhnicheskikh nauk.

Burning coal enrichment by-products in heating and power stations. Koks i khim. no.7:53-58 '57. (MLRA 10:7)

1. Bagleyskiy koksokhimicheskiy zavod (for Miryan and Toptygin).
2. Dnepropetrovskiy khimiko-tekhnologicheskiy institut (for German).
(Coal) (Boilers)



APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001756320003-4"

AUTHOR: Toptygin, L.A. (Bagleyskiy Coke Oven Works).

TITLE: On prolongation of the service life of transformer oils. (Udlinnenie sroka sluzhby energeticheskikh masel).

PERIODICAL: "Koks i Khimiya" (Coke and Chemistry). 1957, No. 4, pp. 56 - 58, (U.S.S.R.)

ABSTRACT: Measures taken on the Bagleyskiy coke oven works for the prolongation of the service life of turbine and transformer oils are described (absorbers, thermo-syphon filters and air filters). The results obtained were satisfactory. There are 4 figures and 1 table.

TOPTYGIN, L.A.

Collecting and purifying vapor condensate in by-product coking plants. Koks i khim.no.7:51-53 '56. (MLRA 9:12)

1. Koksokhimicheskiy zavod.
(Steam) (Coke industry--Equipment and supplies)

BEREZHNYY, M.; TOPTYGIN, V. [Toptykin, V.]

Let's increase the production of local building materials.
Sil'. bud. 7 no.4:14-15 Ap '57. (MIRA 12:11)

1.Predsedatel' soveta Izyumskoy rayonnoy kolkhoznoy stroitel'noy organizatsii Khar'kovskoy oblasti (for Berezhnyy). 2. Glavnyy inzhener Izyumskoy rayonnoy kolkhoznoy stroitel noy organizatsii Khar'kovskoy oblasti (for Toptygin).
(Kharkov Province--Building materials)

S/078/60/005/011/013/025
B015/B060

AUTHORS: Morozov, I. S., Toptygina, G. M.

TITLE: Chloro Titanates and Chloroxy Titanates of Alkali Metals and Ammonium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 11, pp. 2518-2529

TEXT: The authors studied the solubility in systems consisting of hexachloro titanates of cesium, rubidium, ammonium, and potassium with hydrogen chloride and water, since these are used in technological processes. The solubility of cesium- and rubidium hexachloro titanates was studied in the concentration range from 0 to 44.5% HCl at 0°C (Tables 1-2, results), and maximum solubility was established in hydrochloric acid Cs_2TiCl_6 - 0.44% TiO_2 and Rb_2TiCl_6 - 0.96% TiO_2. At an HCl concentration of 28.6% for cesium and 30.0% for rubidium there forms a solid phase corresponding to compound $Me_2TiOCl_4 \cdot H_2O$ (Table 3), whose composition was confirmed by means of Schreinemakers' method. If there is

an excess of alkali metal chloride in the solution, the solubility of the complex salt drops, without there resulting another compound (Table 4). The solubility of ammonium hexachloro titanate $(NH_4)_2TiCl_6$ was studied in the concentration range from 17 to 44.5% HCl at 0°C (Table 5, results), and, in agreement with data by Seidel and Fischer (Ref. 10), 0.12% TiO_2 was found as the minimum solubility. The maximum solubility is 1.16% TiO_2 (35.15% HCl). A compound of composition $3NH_4Cl \cdot 2TiOCl_2 \cdot 4H_2O$ (Table 6) was identified and its solubility was determined (Table 7). The minimum solubility of K_2TiCl_6 in hydrochloric acid saturated with HCl is 0.06% TiO_2 at 0°C (Table 8). Unlike the abovementioned chloro titanates, potassium does not form any chloroxy titanate crystal hydrate. The separating solid phases were subjected to a thermal analysis, and heating curves were drawn for 20° to 1000°C in argon or air. For cesium hexachloro titanate two endothermal effects were observed at a 650°C melting point and a dissociation at 685°C. Rb_2TiCl_6 has only an endothermal effect at 658°C (the melting point) and simultaneous dissociation. Ammonium- and potassium

hexachloro titanate contain 1 mole of crystal water, so that there appears the corresponding endoeffect. The chloroxy titanate compounds obtained were examined by crystal-optical analysis, and the refractive indices (Table 9) were determined. On the basis of these new compounds, several aspects of the state of tetravalent titanium in hydrochloric acid solutions are discussed. An equilibrium is assumed in diluted hydrochloric acid solutions: $[Ti(OH)_2]^{2+} \rightleftharpoons TiO^{2+} + H_2O$, while a complex anion results with rising acid concentration: $[Ti(OH)_2]^{2+} + 4\,Cl^- \rightleftharpoons [Ti(OH)_2Cl_4]$. Yellow-colored hexachloro titanate anion $[Ti(OH)_2Cl_4]^{2-} + 2Cl^- + 2H^+ \rightleftharpoons [TiCl_6]^{2-} + 2H_2O$ forms in concentrated hydrochloric acid solutions. The complete hydrolysis in poorly acid solutions runs as follows: $[Ti(OH)_2]^{2+} + 2H_2O \rightleftharpoons Ti(OH)_4 + 2H^+$, which does not, however, exclude the formation of intermediate stages. There are 7 figures, 9 tables, and 15 references: 5 Soviet and 8 German.

Card 3/3

MOROZOV, I.S.; TOPTYGINA, G.M.

Solubility in the system $TiCl_3$ - NH_4Cl - H_2O (0° isotherm).

Zhur.neorg.khim. 5 no.7:1637-1638 Jl '60. (MIRA 13:7)

(Titanium chloride) (Ammonium chloride)

L 33024-66 EWT(1)/EWP(m)/EWP(f)/T-2 WW

ACC NR: AP6014395 (N) SOURCE CODE: UR/0096/66/000/001/0035/0038

AUTHOR: Danilovskiy, A. G. (Engineer); Topumov, A. M. (Candidate of technical sciences)

ORG: Leningrad Shipbuilding Institute (Leningradskiy korablestroitel'nyy institut)

48
B

TITLE: Improvement of the flow through sections of turbines by an opening at the foot of the vanes

SOURCE: Teploenergetika, no. 1, 1966, 35-38

TOPIC TAGS: steam turbine, turbine blade

ABSTRACT: The article gives the results of an investigation of flow through annular grids with pitched blades, with different angles of taper of the inner boundary surface. The article presents a series of figures showing different geometries of the flow through section of the turbine with various pitches of the vanes. It was found, in general, that the use of a pitch of the vanes with relation to the radius can substantially improve the flow conditions at the foot of the vanes, especially with an open flow through section at the socket. With a pitch of the vanes relative to the radius there was observed a complex

Card 1/2 UDC: 62-135:533.6.001.5

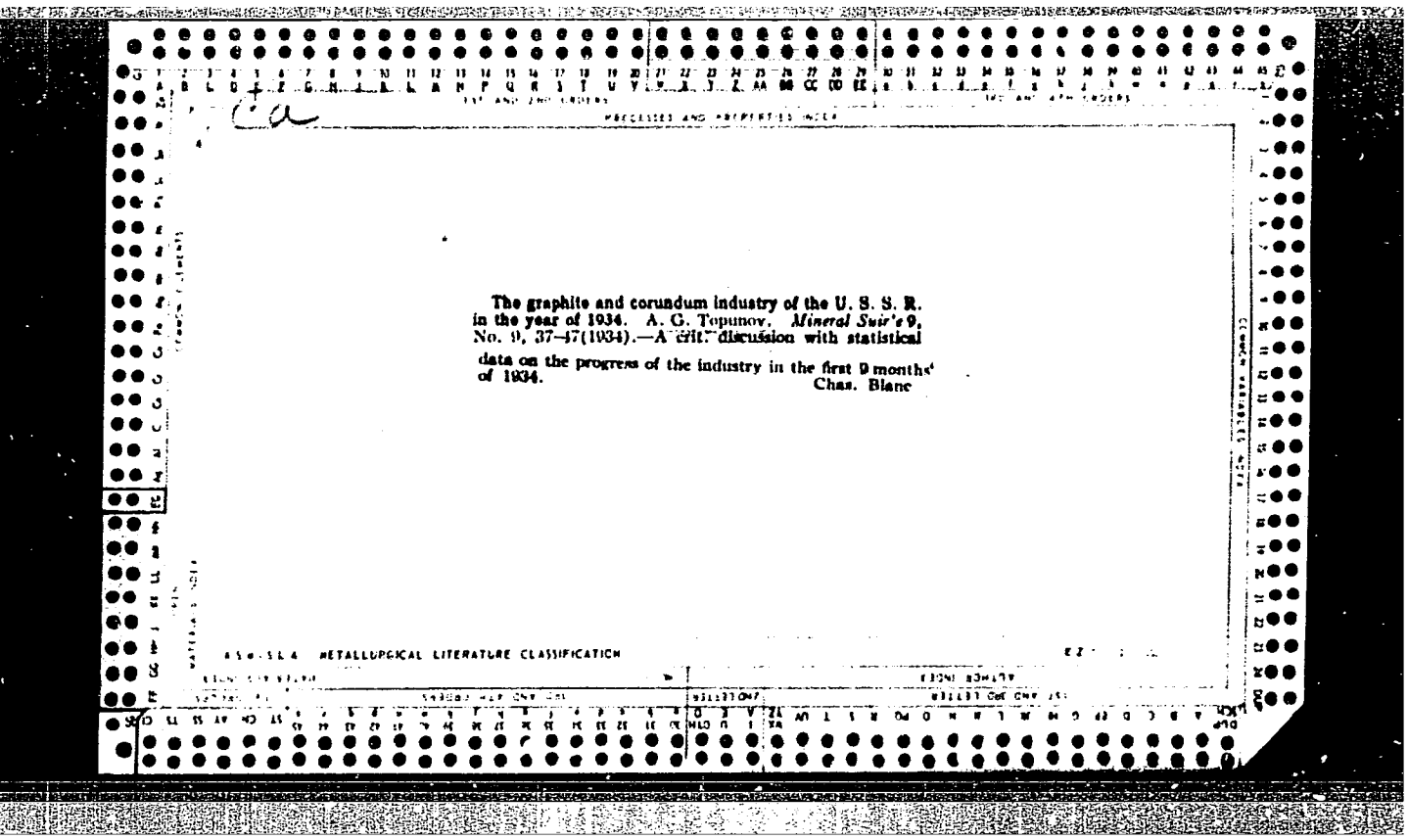
L 33024-66

ACC NR: AP6014395

flow structure, mainly depending on the form of the boundary surface. By varying the form of the boundary surface, with a gradual positive increase in the pitch of the vanes, it is possible to change the gradient of the static pressure beyond the nozzle. Orig. art. has: 6 figures.

SUB CODE: 10/ SUBM DATE: none/ ORIG REF: 005

Card 2/2



The graphite and corundum industry of the U. S. S. R. in the year of 1934. A. G. Topunov. *Mineral Suir's* 9, No. 9, 37–47(1934).—A crit. discussion with statistical data on the progress of the industry in the first 9 months of 1934.
Chas. Blanc

L 07547-67 EWT(d)/EWT(l)/EWP(m)/EWT(m)/EWP(t) WW/DJ

ACC NR: AP6029864 (N) SOURCE CODE: UR/0096/66/000/009/0078/0080

AUTHOR: Danilovskiy, A. G. (Engineer, Dissertant); Topunov, A. M. (Candidate of technical sciences) 43 B

ORG: Leningrad Shipbuilding Institute (Leningradskiy korablestroitel'nyy institut)

TITLE: Effect of the elimination of taper in the nozzle unit on the characteristics of a turbine stage

SOURCE: Teploenergetika, no. 9, 1966, 78-80

TOPIC TAGS: turbine stage, nozzle design

ABSTRACT: The investigation was carried out in two stages with $D_{av}/l = 3$ and 5, in an open type unit. The basic feature of the unit was a single suction system which permitted very accurate measurement of the total moment of the hydraulic braking. The working body was air. The tests were made at small Mach numbers, in the zone of self-similarity with respect to the Reynolds number. In the experiments, measurements were made of the overall characteristics--the efficiency of the stages, the moment, and the reactions at the base and the periphery of the blades. Results are shown in graphic form. It was found that elimination of the taper in the nozzle unit exerts a substantial effect on the characteristics of the turbine stages. It improves the structure of the flow in the stages, and reduces the difference in the reaction at the

Card 1/2 UDC: 621.165.533.6 001 5

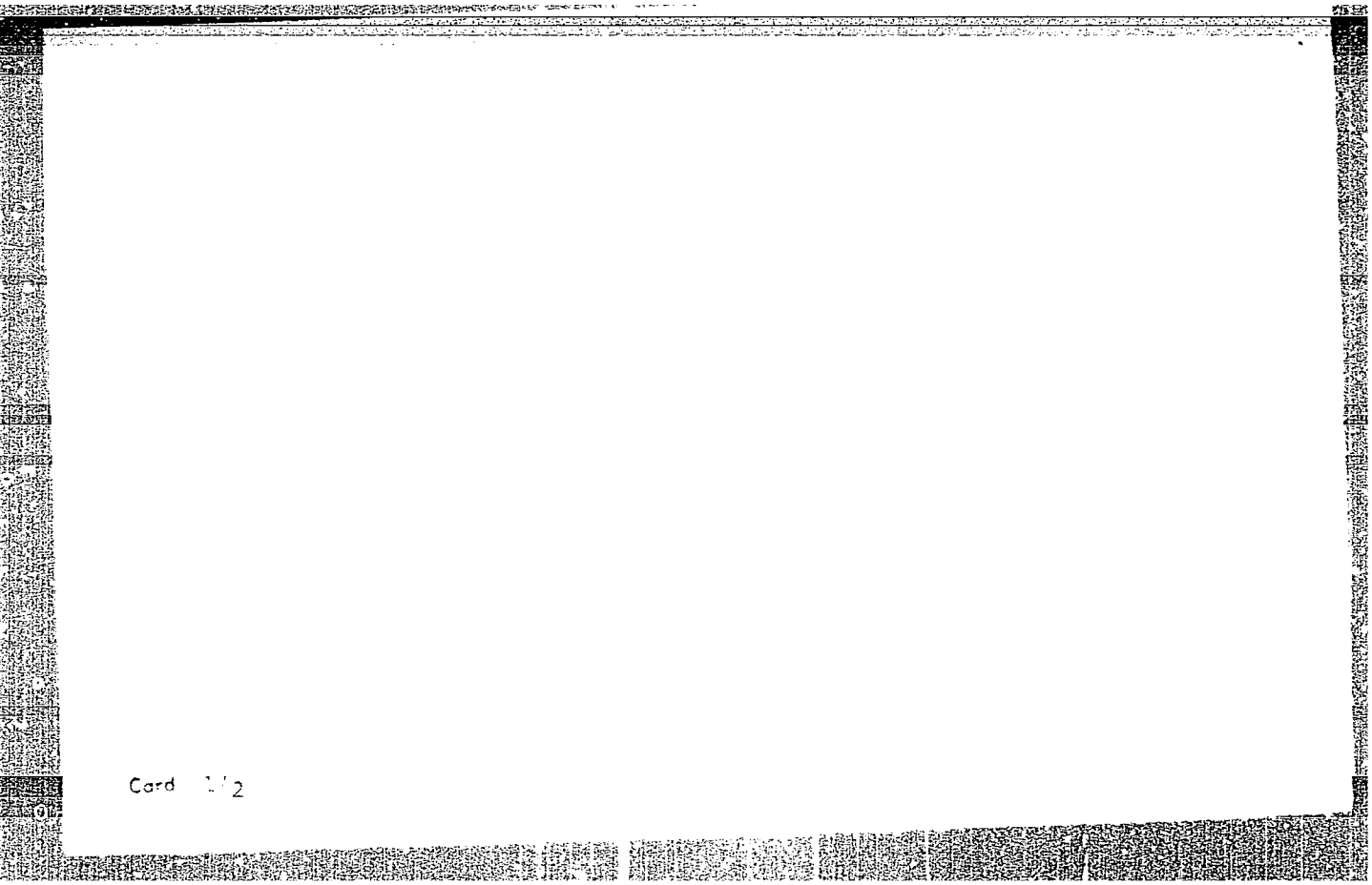
L 07547-67

ACC NR: AP6029864

tip and at the base of the blades. Use of a diagonal working wheel somewhat reduces the effect of elimination of the taper in the nozzle unit. Orig. art. has: 6 figures.

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 007
10/

Card 2/2



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L 45187-66 EWT(m)/EWP(w)/EWP(f)/T/EWP(t)/ETI JD/HW

ACC NR: AR6028063 SOURCE CODE: UR/0285/66/000/005/0020/0020

65

B

AUTHOR: Topunov, A. M.; Tikhomirov, B. A.; Markozov, N. D.

ORG: none

TITLE: The relationship between the stage and cycle parameters in a single-stage lightweight gas turbine

SOURCE: Ref. zh. Turbostroyeniye, Abs. 5.49.94

REF SOURCE: Tr. Leningr. korablestroit. in-ta, vyp. 47, 1965, 145-154

TOPIC TAGS: gas turbine, gas turbine test, turbine blade, single stage compressor

ABSTRACT: The selection of cycle parameters of a high-pressure turbine in a simple gas-turbine unit is studied. The unit consists of a single-stage turbo-compressor, a combustion chamber, and a driving turbine. The principle of a constant safety factor for the fatigue strength of the turbine blades was followed in determining the effect of these parameters on the efficiency of the whole unit. [KP]

SUB CODE: 21/

UDC: 621.438.001.24

Card 1/1

L 01069-67 EWT(m)

ACC NR: AP6022418 (N) SOURCE CODE: UR/0229/66/000/002/0025/0029

AUTHOR: Tikhomirov, B. A.; Topunov, A. M.; Markov, V. L.; Kulesh, Yu. N.

ORG: None

TITLE: Selecting the type of transmission and propeller for hydrofoil vessels

SOURCE: Sudostroyeniye, no. 2, 1966, 25-29

TOPIC TAGS: jet propulsion, hydrofoil, vehicle power transmission system, shipbuilding engineering

ABSTRACT: The authors discuss the problem of power transmission from engine to propeller in hydrofoil craft. The only type of transmission presently used for vessels of this class now in operation or under construction is the mechanical type with straight or bent shaft tube. A transmission with straight shafting is attractive from the standpoint of simplicity although it involves difficulties in locating passenger compartments (the engine must be placed in the bow or midsection), and large losses in torque due to unfavorable conditions of propeller operation. A recent innovation is the transmission with vertical shaft of the "column" type which reduces drag from protruding elements and increases the propulsion factor. The column may be rotated about the vertical axis to solve steering and reversal problems. However, this type of transmission requires spiral gears which are difficult to manufacture for high-power

Card 1/2 UDC: 629.125.8-8

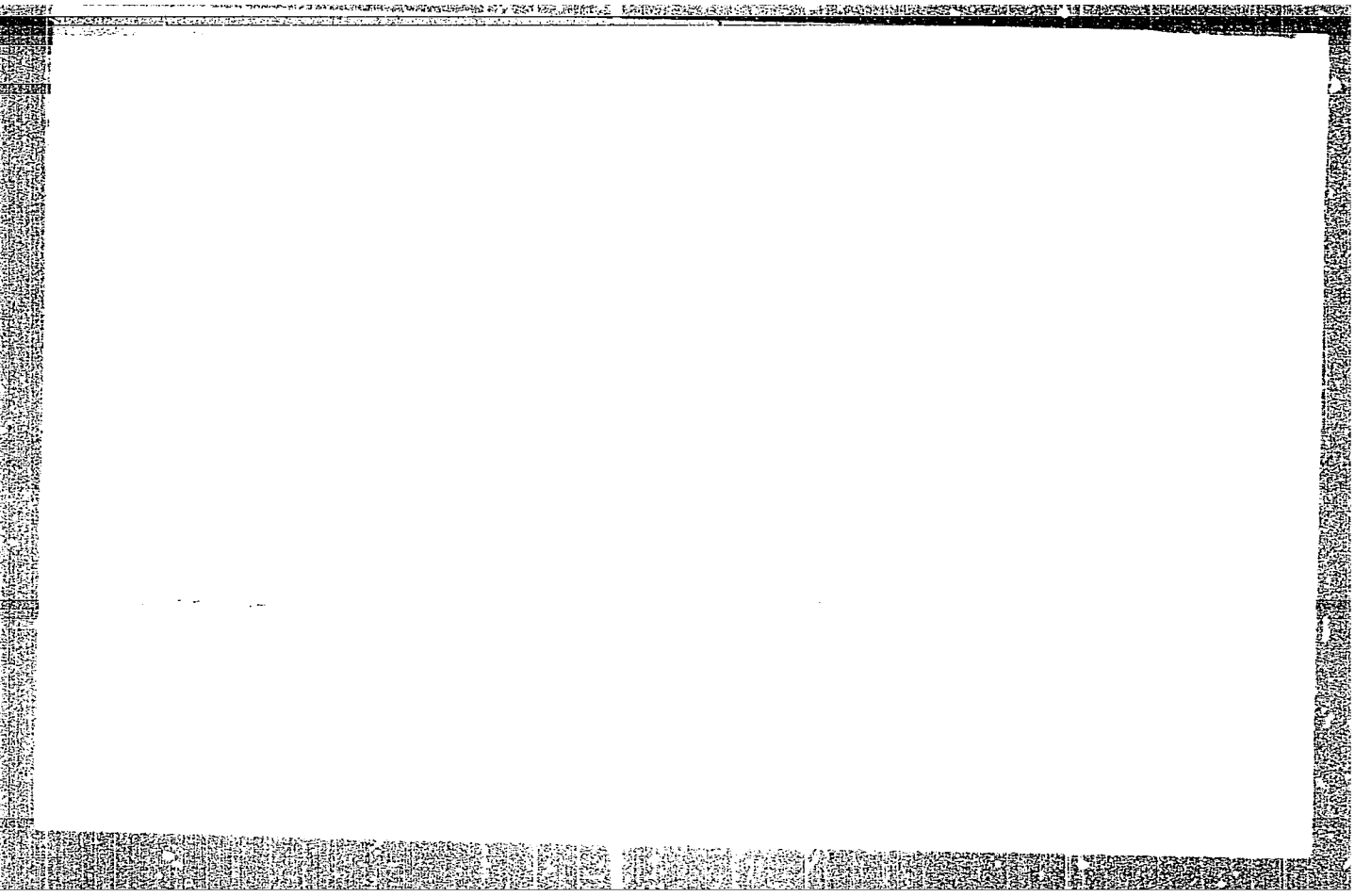
L 01069-67

ACC NR: AP6022418

transmissions. The most compact and strongest transmission of this type uses power doubling through two coaxial shafts rotating in opposite directions. Several modifications of this design are discussed. It is shown that a planetary speed reducer has overall dimensions considerably smaller than those of a cylindrical speed reducer. A planetary reducer also is considerably simpler than a spiral speed reducer to manufacture in spite of design complexities. It is shown that the best screw design is the hydraulic jet type which simplifies reversal problems. Orig. art. has: 4 figures, 4 tables.

SUB CODE: 13/ SUBM DATE: None/ ORIG REF: 003/ OTH REF: 004

Card 2/2 vlr



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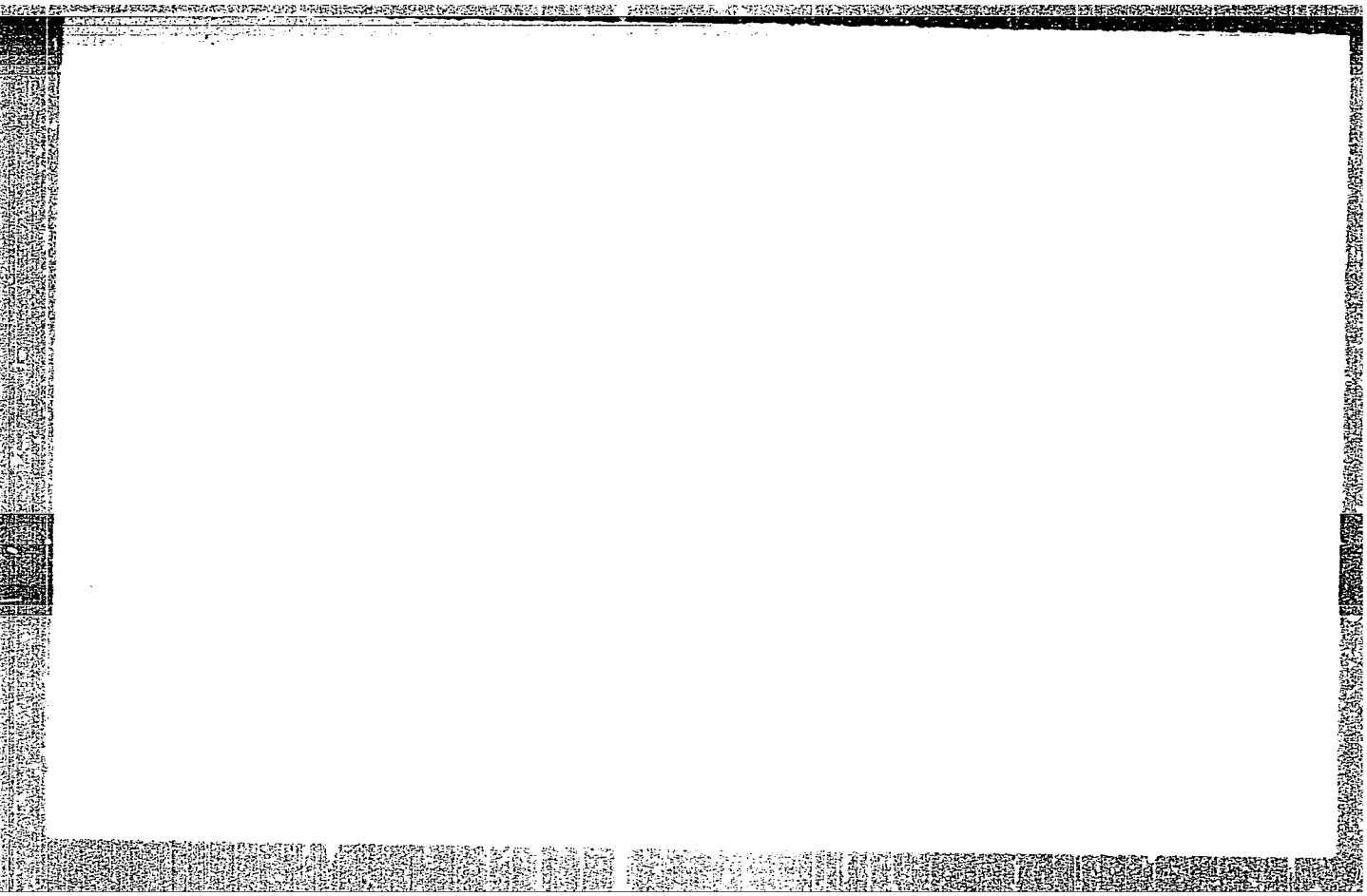

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TOPUNOV, A.M.

Effect on the applicability limit of the cylindrical turbine stage theory of the value of flow losses and the character of their changes in radius. Trudy LKI no.34:187-195 '61.
(MIRA 15:8)

1. Kafedra sudovykh parovykh i gazovykh turbin Leningradskogo korablestroitel'nogo instituta.
(Marine turbines)

TOFUNOV, A.M., kand.tekhn.nauk

Design of a stage with conical limiting surfaces. Teploenergetika 8 no.12:55-59 D '61. (MIRA 14:12)

1. Leningradskiy korablestroitel'nyy institut.
(Turbines--Design and construction)

27541
S/123/61/000/014/039/045
A004/A101

26.2171

AUTHOR: Topunov, A.M.

TITLE: One of the applications of the theory of turbine stages at incon-stant full parameters along the radius before the nozzles

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 14, 1961, 27, abstract 14I195 ("Tr. Leningr. korablestroit. in-ta", 1960, no. 32, 97-102)

TEXT: To avoid distortions of the flow lines and radial flows in the flow area of turbines, the author suggests to change the full parameters along the radius in front of the nozzle assembly. He derives formulae for the calculation of the velocity at the nozzle assembly inlet and the flow angles, taking into consideration the loss for any vortex regularity under the condition of cylindrical flows. The losses are taken into account by defining the exponent of the polytrop of expansion in the nozzle.

I. Barskiy

[Reviewer's note: It is not pointed out in this work that the suggested method

Card 1/2

One of the applications ...

of profiling is only applicable for the second and the subsequent stages of multistage turbines, nor was the fact mentioned that in this case part of the turbine stages will have variable work along the radius, which might be the source of great additional losses.]

[Abstracter's note: Complete translation]

Card 2/2

ACC NR: AP6032582 (N) SOURCE CODE: UR/0143/66/000/009/0054/0063

AUTHOR: Myachin, Ye. V. (Engineer); Topunov, A. M. (Candidate of technical sciences; Docent)

ORG: Leningrad Ship Building Institute (Leningradskiy korablestroitel'nyy institut)

TITLE: The problem of investigating turbine stage performance under variable regimes and supersonic exit velocities

SOURCE: IVUZ.. Energetika, no. 9, 1966, 54-63

TOPIC TAGS: turbine design, turbine stage ~~performance~~, single stage turbine, turbine performance analysis, difference method, difference equation, supersonic flow, subsonic flow

ABSTRACT: A difference method is proposed for the analysis of turbine stage performance under variable regimes and at supersonic flow exit velocities. The method, based on the use of gasdynamic functions (reduced flow rate and reduced velocity), consists in: 1) setting up difference equations taking into account the possible expansion of a working medium in an oblique lattice cross section, and 2) classification and analysis of various flow cases and the establishment of their characteristics. The use of the method is illustrated by applying it

 UDC: 621.165.

ACC NR: AP6032582

to the calculation of a single stage turbine. The method makes it possible to determine the stage parameters for turbines with subsonic and supersonic flow exit velocities under regimes different from the design regimes. Orig. art. has: 15 formulas, 2 figures, and 2 tables. [WA-76]

SUB CODE: 21/ SUBM DATE: 19Apr65/ ORIG REF: 005/ OTH REF: 001

Card 2/2

TOPUNOV, A.M., kand. tekhn. nauk, dotsent; DANILOVSKIY, A.G., inzh.

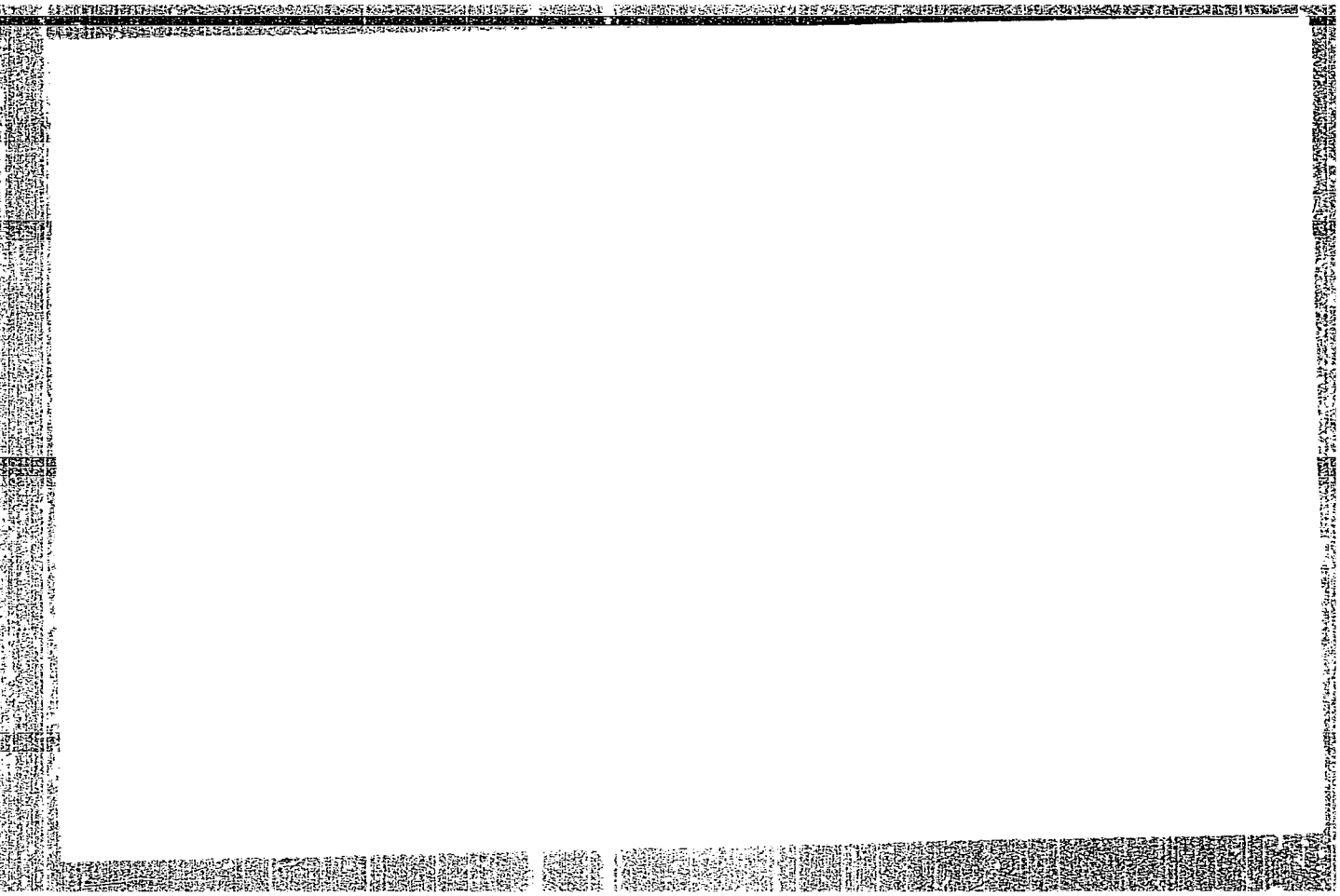
Solution of a direct problem in the calculation of a three dimentional axisymmetric stream. Izv. vys. ucheb. zav.; energ. 7 no.11:54-65 N '64 (MIRA 18:1)

1. Leningradskiy korablestroitel'nyy institut. Predstavlena kafedroy sudovykh parovykh i gazovykh turbin.

TOPUNOV, A.M.

Theory of a turbine stage with long blades when complete parameters vary around the radius before the stage. Trudy LKI no.26: 179-181 '59. (MIRA 14:9)

1. Kafedra sudovykh parovykh i gazovykh turbin Leningradskogo korablestroitel'nogo instituta.
(Turbines)



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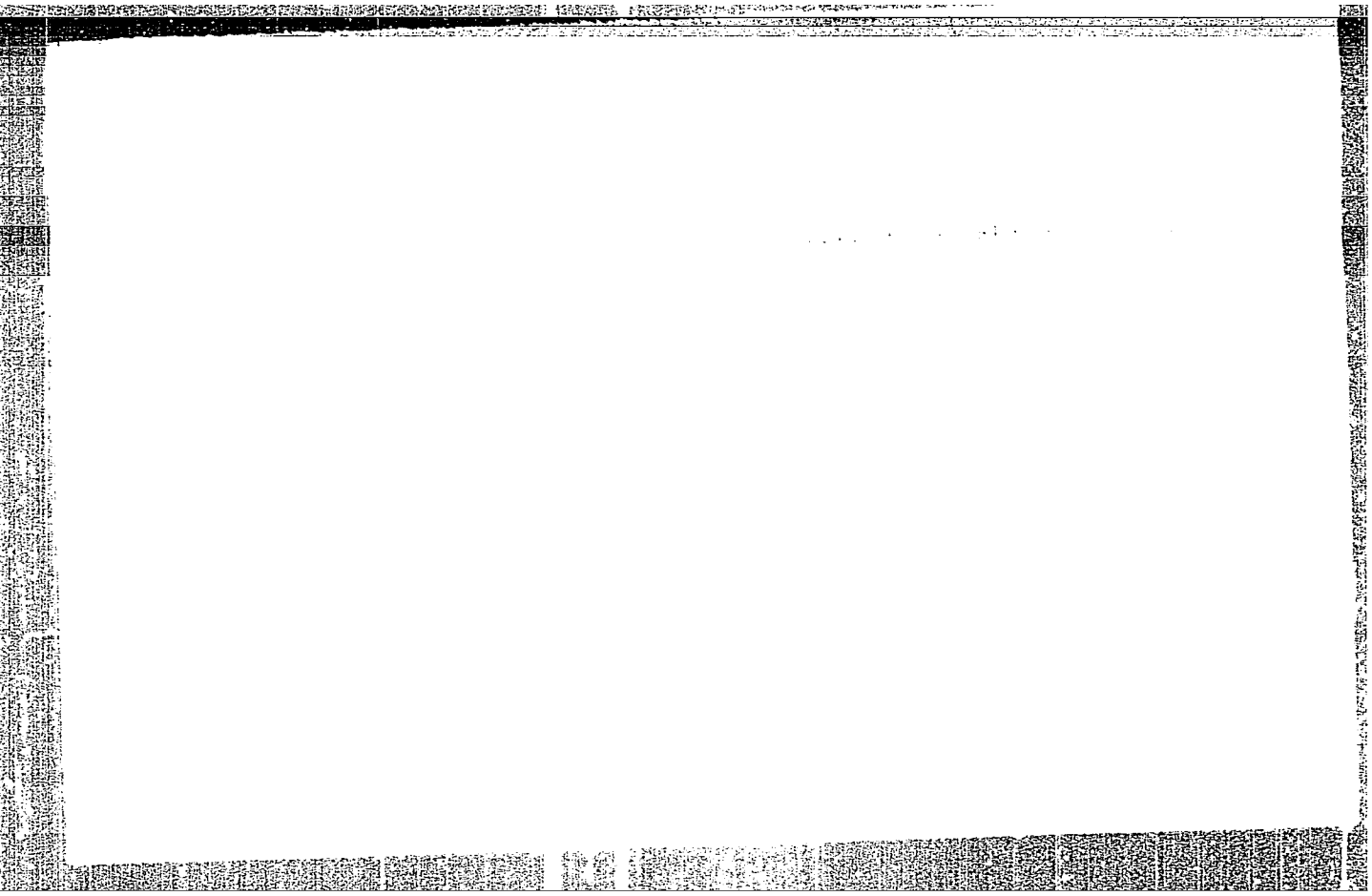

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TOPUNOV, A.M.

Some results of investigating the spiral outlet flow of ring blading profiles. Trudy LKI no.29:193-197 '59. (MIRA 14:7)

1. Leningradskiy korablestroitel'nyy institut, kafedra sudovykh parovykh i gazovykh turbin.
(Fluid dynamics) (Marine turbines)

TOPUNOV, A.M., kand.tekhn.nauk; DANILOVSKIY, A.G., inzh.

Operation of a turbine stage with relatively long blades in non-predetermined operation. Izv. vys. ucheb. zav.; energ. 6 no.5: 55-62 My '63. (MIRA 16:7)

1. Leningradskiy korablestroitel'nyy institut.
(Gas turbines)

ACCESSION NR: AP4006173 S/0229/63/000/012/0029/0032

AUTHOR: Topunov, A. M. (Candidate of technical sciences); Myachin, Ye. V. (Engineer)

TITLE: Problem of using a difference method for analyzing turbine stage performance under variable regimes

SOURCE: Sudostroyeniye, no. 12, 1963, 29-32

TOPIC TAGS: turbine performance, difference method, turbine, turbine stage, firite difference method, relaxation method, gas turbine, gas turbine unit, gas turbine performance

ABSTRACT: The authors make use of the difference methods of A. Ya. Cherkez /Primeneniye Metoda Maly*kh Otkloneniy v Teorii i Raschete Aviatsionny*kh TRD (Applications of the Method of Small Deviations in the Theory of and Calculations for Aviation Turbojet Engines) Oborongiz, 1955/, which they apply to the analysis of the working of single- and multi-stage gas turbines in different regimes. The parameters considered in describing the regime are pressure and temperature fore and aft of the turbine stage, consumption of working fluid and rotational speed of the turbine. Universal characteristic curves are presented which show the pressure drops and efficiencies for a two-stage turbine against axes labeled

Card 1/2

ACCESSION NR: AP4006173

$G\sqrt{T^*_0}/p^*_0$ and $n/\sqrt{T^*_0}$, where G is the weight consumption of working substance, T the temperature, p the pressure and n the turbine revolutions. It is stated that an extension of difference techniques to turbines in supercrutical regimes and in special constructions (such as a bi-rotating turbine) is in progress.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 07Jan64 ENCL: 00

SUB CODE: PR NO REF SOV: 005 OTHER: 000

2/2

Card

22216

S/124/61/000/003/006/028
A005/A105

26.2141

AUTHOR: Topunov, A. M.

TITLE: Some results from the investigation of the twisted flow behind the annular cascades of profiles

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 3, 1961, 25, abstract 3B149. (Tr. Leningr. korablestroit. in-ta, 1959, no. 29, 193-197)

TEXT: Measurements of the flow parameters in an annular tube at different distances behind three cascades were carried out (λ = D/h = 6.02, 3.56, and 2.12, where D is the average diameter, h is the height of blade) for full and partial (partiality degree ε = 0.267) admission to the impeller. The character and the causes of dead zone formation behind the cascades were investigated.

V. Mitrokhin

[Abstractor's note: Complete translation]

Card 1/1

87888
S/114/60/000/005/002/006
E194/E255

26.2122

AUTHOR: Topunov, A. M., Candidate of Technical Sciences

TITLE: The Causes and Character of the Formation of Stagnant Zones in a Swirling Flow

PERIODICAL: Energomashinostroyeniye, 1960, No. 5, pp. 10-13

TEXT: A swirling flow in an annular space has certain special features; in particular, the static pressure increases with radius. The theory of swirling flow and especially the equations of radial equilibrium, are widely used in the design of axial turbines. A number of authors have developed the theory of a cylindrical stage on the basis of the theory of a swirling flow. Extensive experiments have shown that over a wide range of blade lengths and outlet angles a cylindrical stage may be used to determine the flow parameters at various radii. It has also been shown that with comparactively short blades the swirling flow is very stable, and some increase in the closed axial gap can improve the stage efficiency. However, the tests that have been made do not cover the whole range of application of long blades. For instance, there have been no investigations of axial

Card 1/5

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E194/E255

The Causes and Character of the Formation of Stagnant Zones in a Swirling Flow

stages and their elements with very long blades and small angles of flow discharge. Also, there are practically no data on the stability of a swirling flow with long blades and large axial gaps. The problem of reducing the vibration impulses for long blades is very important but with very long axial gaps there must not be any discontinuities in the flow. It is accordingly of considerable interest to carry out experiments on a swirling flow in an annular cylindrical space with long blades and comparatively small angles of flow discharge, and also with sloping, i.e. non-radial, blades. Tests were made with five sets of annular blading, three with radial blading and different ratios of internal to external diameter, i.e. blade length, and two with non-radial blading. The diameter of the blade tips was always 365 mm, and the blades were cylindrical; the other blade data are tabulated. The outer tube was made very long, to overcome edge effects. The test results obtained with radial blades are plotted in Fig. 2 which gives flow angles in the annular cylindrical space beyond the blading. Fig.

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E194/E255

The Causes and Character of the Formation of Stagnant Zones in a Swirling Flow

3 plots the total pressure distribution for one set of blading and Fig. 4 indicates the static pressure distribution at a distance of 2.5 mm from the edges. It is shown that with some of the blades the swirling flow is unstable and breaks away immediately beyond the blading. With other blading no such unstable zone is formed. After the results have been described they are discussed. It is stated that with long blades and comparatively small discharge angles breakaway of flow may occur at some distance beyond the nozzle, which is naturally a hindrance to the use of large closed gaps with such blading. Of course, swirling and internal friction in the flow during the formation of the stagnant zone can considerably reduce the stage efficiency. It is also evident that where there is a tendency to the formation of stagnant zones it is desirable to have a certain degree of reaction at the blade root, as this will improve the flow structure. When breakaway of flow occurs, the normal relationship between radius and static pressure is also likely to be much

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The Causes and Character of the Formation of Stagnant Zones in a Swirling Flow

disturbed. The reasons why flow is unstable with long blades and comparatively small discharge angles are discussed. The stagnant zone forms directly on the blading with the radial blades, for internal reasons. The particles of flow on leaving the blading move in such a way that they fulfil the condition of constant moment of momentum for each particle. Consequently, increase in the radius at which a particle is located should lead to reduction in the peripheral component of its speed and then a new equilibrium condition may be set up. In some cases where a stagnant zone is set up at a considerable distance from the blading it is evidently due to friction. The effects observed with non-radial blades are then discussed. The experimental results are plotted and described. The slope of the blades was comparatively large. With one set of blades the static pressure at the root beyond the blading is somewhat greater than the static pressure at the tip, and with the other set of blading it is the other way round. Accordingly, if the blades are sloping, the relation between

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The Causes and Character of the Formation of Stagnant Zones in a Swirling Flow

radius and pressure which is valid for a cylindrical stage is upset. The complex changes in static pressure on the surface of the outer bounding tube (Fig. 6) are evidence of flow instability beyond the sloping blade. The causes of the observed effects are briefly discussed. It is concluded that with comparatively long sloping blades the majority of the flow particles that leave the blading move in a plane section perpendicular to the blades. Such a direction of flow causes it to be non-coaxial and unstable. Accordingly, large axial gaps cannot be used when the blades have considerable slope. There are 6 figures, 1 table and 11 references; 9 Soviet and 2 non-Soviet.

Card 5/5

TOPUNOV, A. M., kand. tekhn. nauk

Causes and character of formation of stagnant zones in an involute stream. Energomashinostroenie 6 no.5:10-13 My '60. (MIRA 13:9)

(Aerodynamics) (Steam turbines)

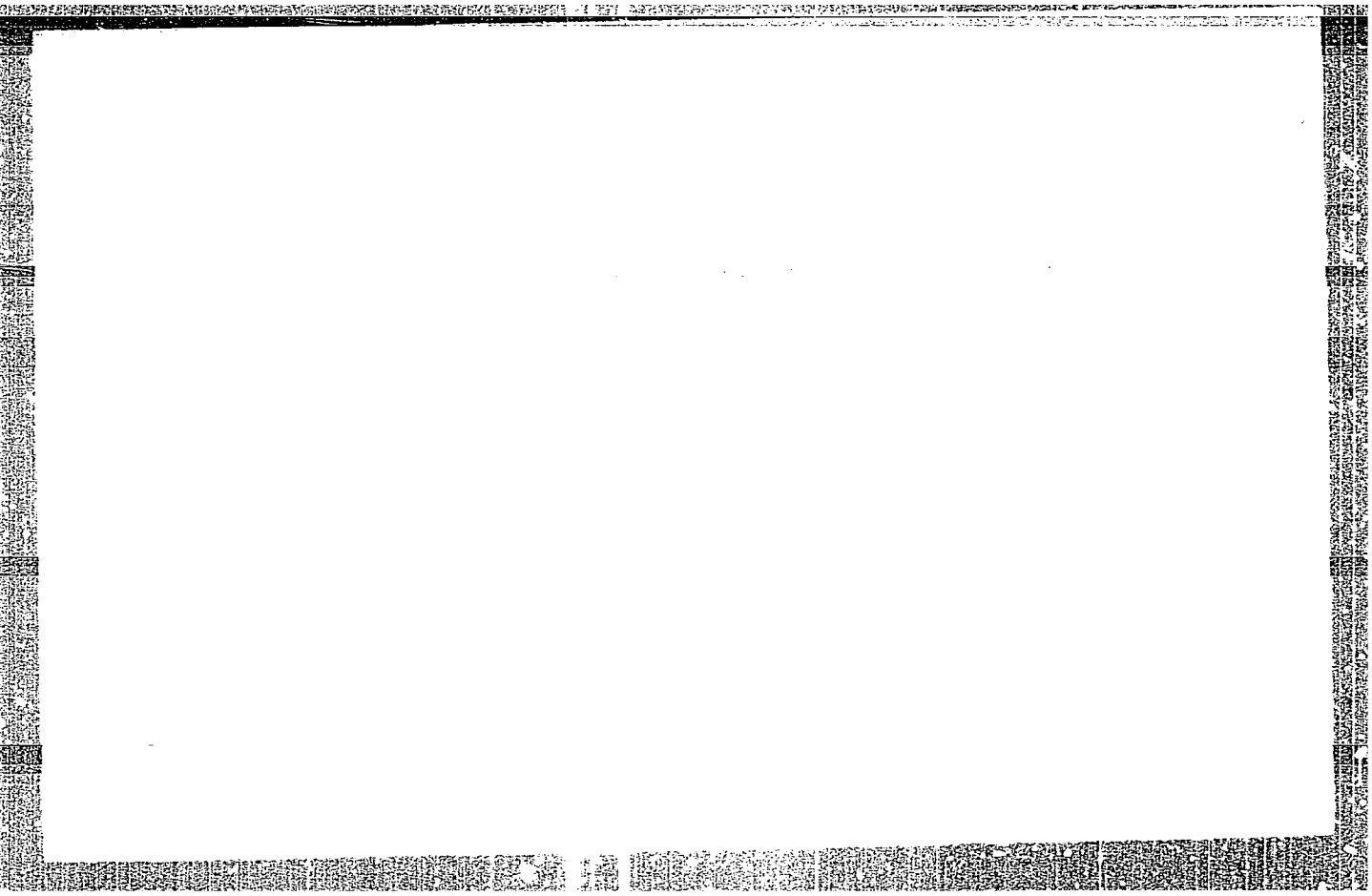
TOPUNOV, A.M., kand.tekhn.nauk

Theory of a turbine stage with long blades with variability of parameters with respect to the radius before the nozzle apparatus and with a purely axial outlet ($C_{2u} = 0$). Teploenergetika 7 no.5:27-32 My '60. (MIRA 13:8)

1. Leningradskiy korablestroitel'nyy institut.
(Turbines--Blades)

TOPUNOV, A.M., kand.tekhn.nauk

Approximate calculation of nonconstant parameters in radius and of losses in the calculation of stages with long blades. Sudostroenie 26 no.9:31-32 S'60. (MIRA 13:10)
(Marine gas turbines)



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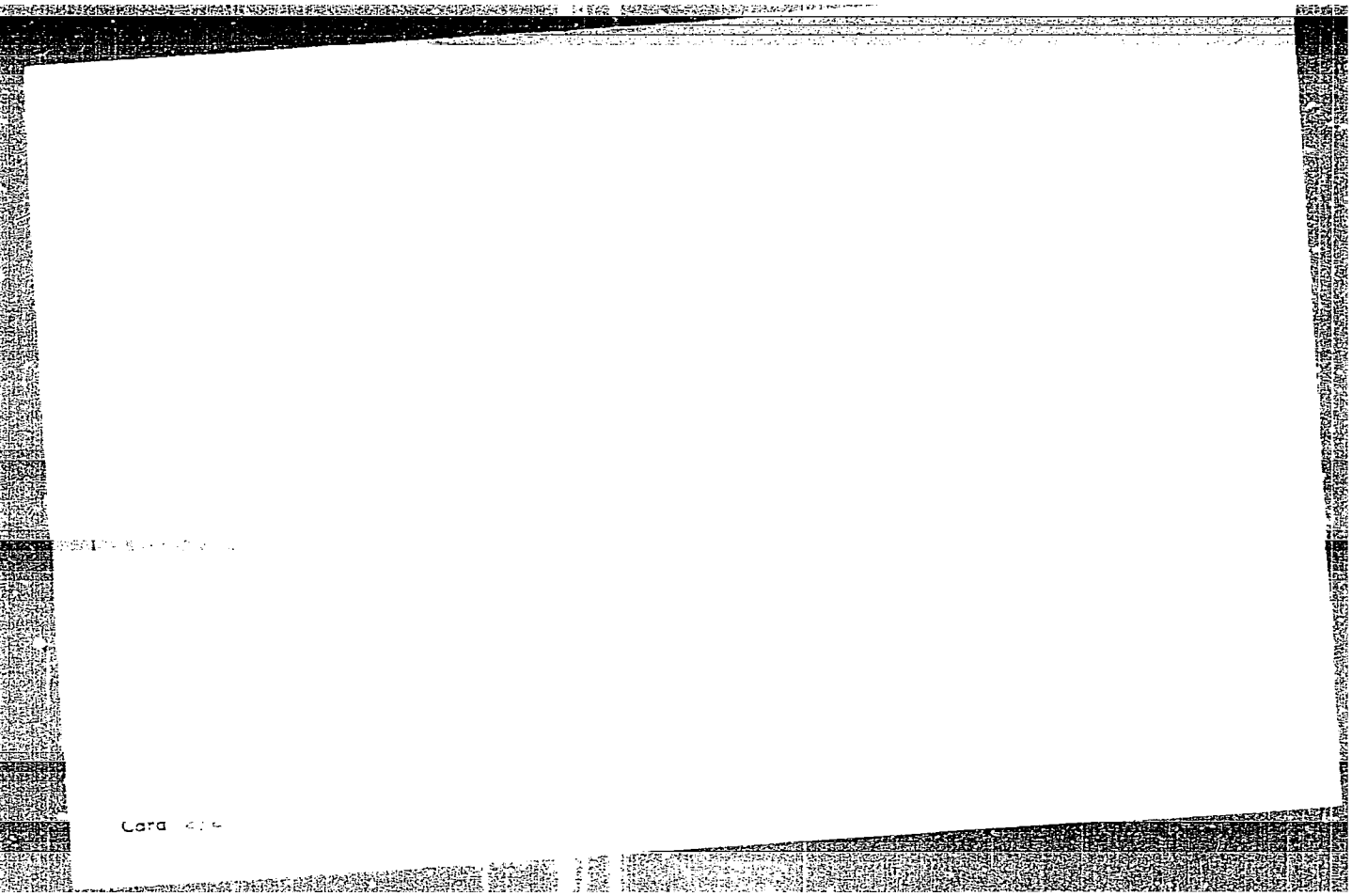

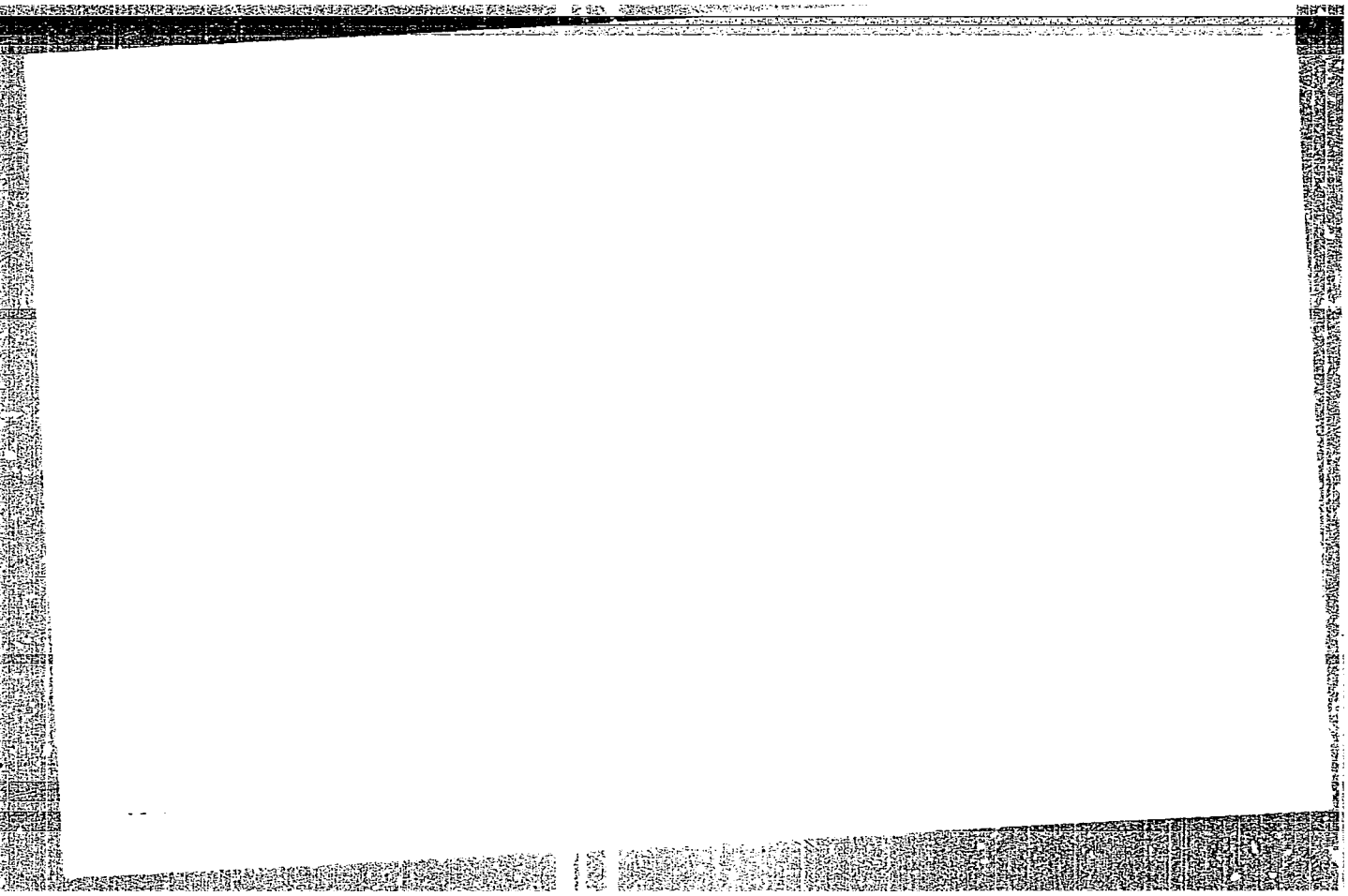

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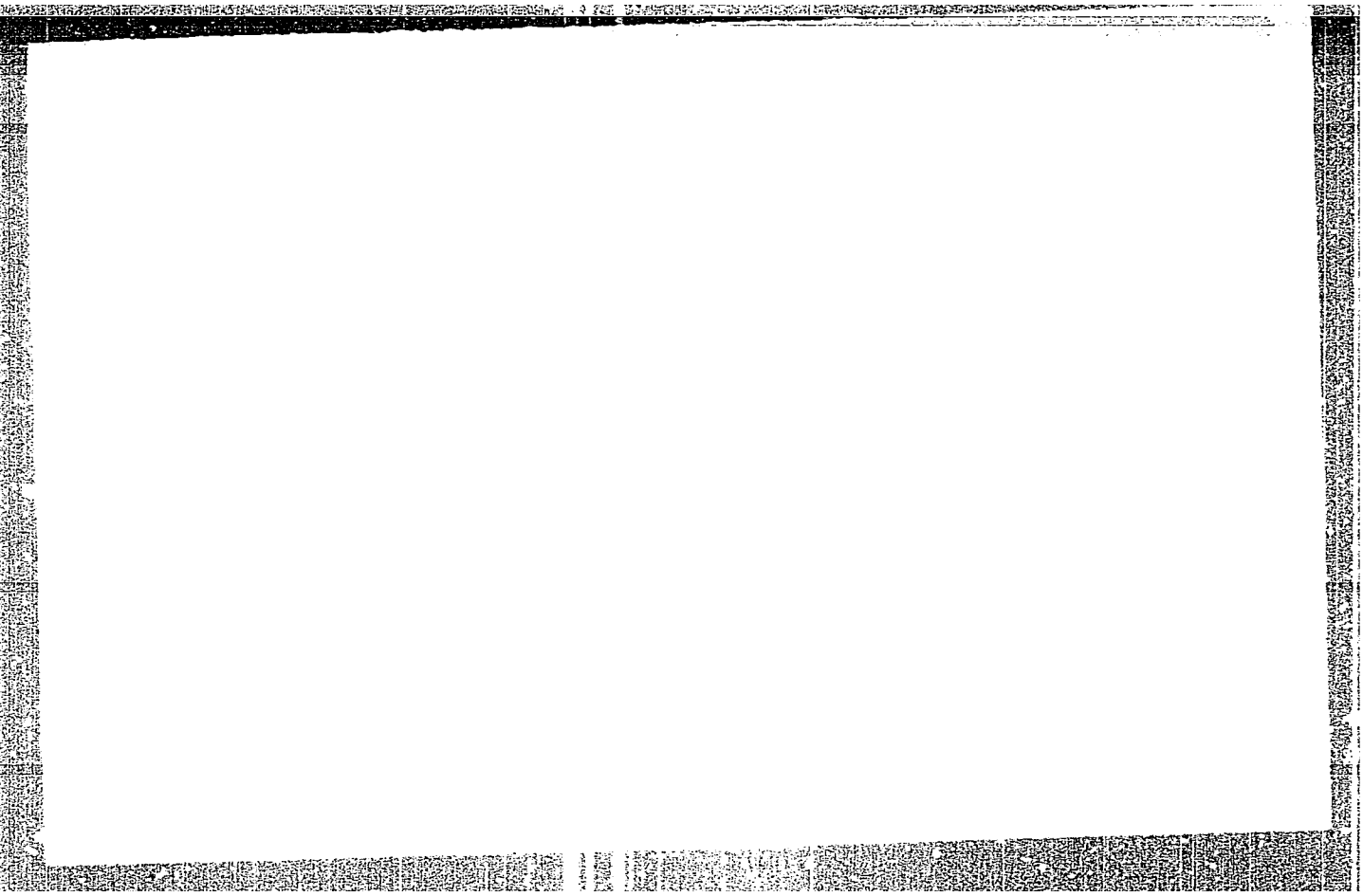

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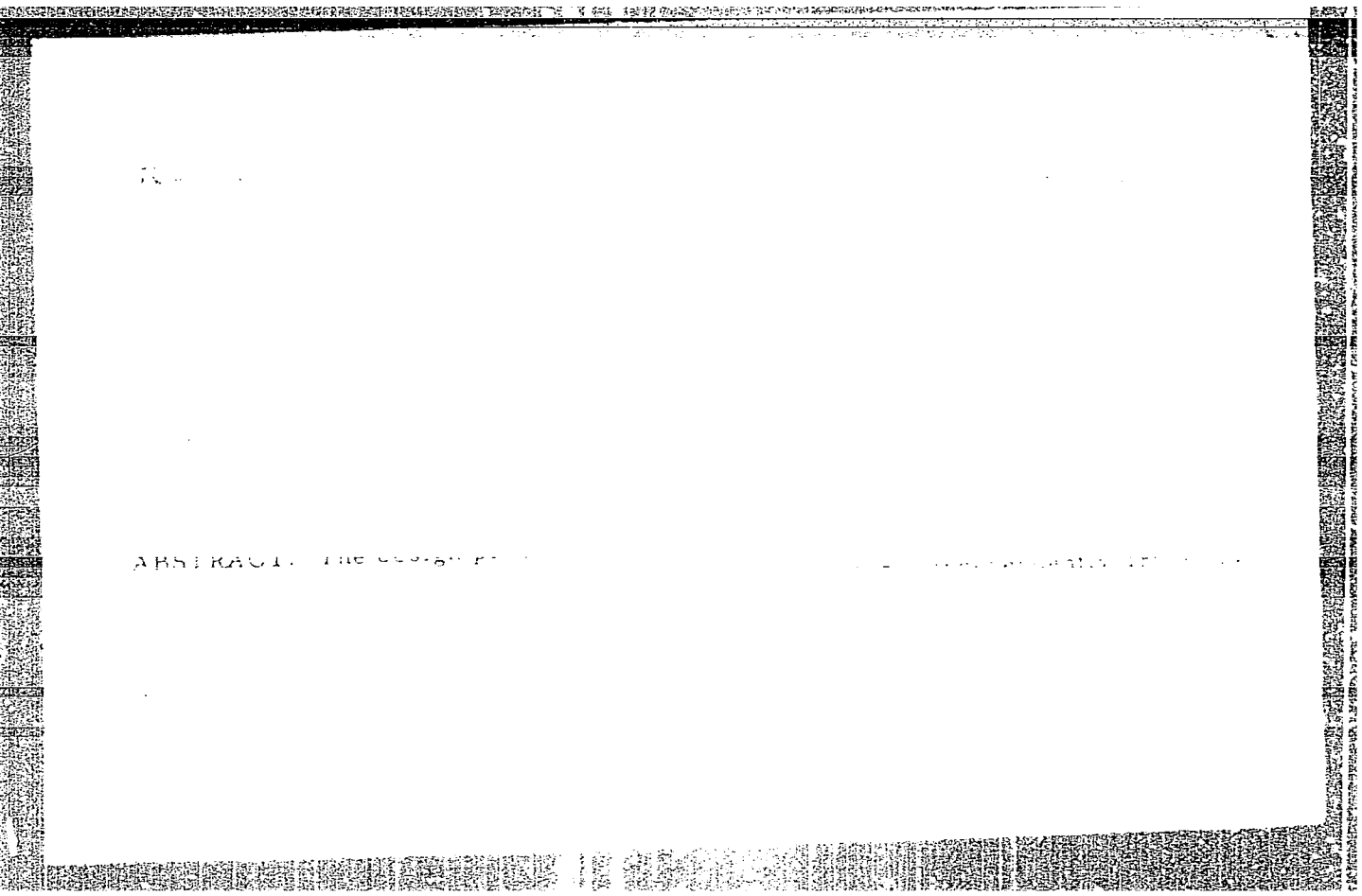

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NO REF SOV: 004 OTHER: 002

TOPUNOV, A.M.

One of the uses of the turbine stage theory when full parameters vary along the radius in front of the nozzels. Trudy LKI no.32: 97-102 '60. (MIRA 14:2)

1. Kafedra sudovykh parovykh i gazovykh turbin Leningradskogo korablestroitel'nogo instituta.
(Turbines)

PROTASOV, A.M., kand. fiz.-matem. nauk, dotsent; TOPUNOV, A.M., kand. tekhn. nauk, dotsent

Calculation of a spatial axisymmetrical flow in turbomachines and aerodynamic systems. Izv. vys. ucheb. zav.; energ. 7 no.9:43-48 S '64. (MIRA 17:11)

1. Leningradskiy korablestroitel'nyy institut. Predstavlena kafedroy sudovykh parovykh i gazovykh turbin.

30876
S/143/61/000/004/003/005
D203/D301

26.2122

AUTHOR: Topunov, A.M., Candidate of Technical Sciences

TITLE: Problem of designing a turbine stage with long blades

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Energetyka, 4, no. 4, 1961, 58 - 65

TEXT: The author derives and solves the equation of radial equilibrium to obtain an accurate interdependence between the blade angle and fluid velocity, taking into account friction losses and variation of total head properties along the radius. The general form of the equation is

$$g v_1 \frac{\partial p_1}{\partial r} = \frac{c_{1u}^2}{r} \qquad (1)$$

or

$$\frac{1}{2} \cdot \frac{\partial c_1^2}{\partial r} + \frac{c_{1u}^2}{r} = 0. \qquad (2)$$

Card 1/5

Problem of designing a turbine ...

In the analysis the following suffixes are used: 0 - section before the stage; 1 - section after nozzles; 2 - section after working blades; k - blade root; m - mean diameter; t - blade tip; * - total head value; ad - value at the end of adiabatic expansion. First, the method of polytropic efficiency φ_p^2 (not to be confused with the adiabatic nozzle efficiency φ^2) is used. Given $T_0^* = f(r)$ and $p_0^* = f(r)$, a constant φ_p^2 will correspond to a definite radial variation of the nozzle velocity coefficient φ. However, given T_0^* and φ as functions of radius, a constant φ_p^2 will determine a radial variation of p_0^*. This method enables simple integration of the equation of radial equilibrium, whereas finding $\varphi_p^2 = f(\varphi, p_0^*, T_0^*)$ is more difficult. Thus, for $c_{1u} r^n = \text{const}$ and $r_m = 1$, the integration results in

Problem of designing a turbine ...

$$tg^2\alpha_1 = r^{2n}\left(tg^2\alpha_{1m} + \frac{n - \varphi_p^2}{n}\right) - \frac{n - \varphi_p^2}{n} + 2gc_p \frac{T_o^* - T_{om}^*}{c_{lum}^2} r^{2n} \qquad (11)$$

which is useful in designing a stage with a given radial variation of c_{1u} and in studying the effect of losses and of variable gas parameters on flow angles at various constant values of φ_p^2. When friction loss and total head properties all vary with the radius, another approach must be used. Expression of C_1 is differentiated and substituted in Eq. (1). The resulting equation is made integrable by putting as follows:

1) $p_o^* = p_{om}^* r^{-\xi}$; 2) $\frac{T_{1ad}}{T_1} = \left(\frac{T_{1ad}}{T_1}\right)_m r^{-\mu}$; 3) $\sin\alpha_1 = \sin\alpha_{1m} r^{-\omega}$;

4) $\varphi^2 = \varphi_m^2 r^{-\theta}$.

Card 3/5

Problem of designing a turbine ...

The blade amy be divided into sections, if different values of indices μ, θ, ω, ξ must be used. Subsequent integration gives

$$\frac{c_1^2}{c_{1m}^2} = \frac{\varphi^2}{\varphi_m^2} \cdot \frac{T_o^*}{T_{om}^*} \left(\frac{p_o^*}{p_{om}^*}\right)^{\frac{1-k}{k}} \exp\left[2\varphi^2 \left(\frac{T_{1ad}}{T_1}\right)_m \frac{r^{-(\mu+\theta)}-1}{\mu+\theta} - 2\left(\frac{\varphi^2 T_{1ad}}{T_1 \sin^{-2}\varphi_1}\right)_m \right.$$

$$\left. \frac{r^{-(\mu+\theta+2\omega)}-1}{\mu+\theta+2\omega} - \xi gR\left(\frac{T_o^*}{c_{1u}^2}\right)_m (r^{2\varphi_m^2 \cos^2\alpha_{1m}} - 1)\right] \qquad (23)$$

which is useful for design work and for performance calculations from test data. A figure shows the effect of non-constant gas parameters and flow losses on radial variation of c_1. The data for calculations were: $\varphi_k = 0.97$; $\alpha_1 = 20^0 = \text{const}$; $C_{1k}(kgRT_{ok}^*)^{-1/2} = 0.88$. as can be seen, losses and radial variation of gas state cannot be neglected. There are 4 figures and 11 Soviet-bloc references.

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30876
S/143/61/000/004/003/005
D203/D301

Problem of designing a turbine ...

ASSOCIATION: Leningradskiy korablestroitel'nyy institut (Leningrad Shipbuilding Institute)

SUBMITTED: May 16, 1960

Card 5/5

30285

S/096/61/000/012/002/003
E194/E155

AUTHOR: Topunov, A.M., Candidate of Technical Sciences

TITLE: The design of stages with conical bounding surfaces

PERIODICAL: Teploenergetika, no.12, 1961, 55-59

TEXT: In steam and gas turbines most stages with relatively long blades are bounded by conical surfaces, and such stages are here termed "conical". The cone angle or taper of the bounding surfaces influences the variation in stage parameters along the radius. The object of this article is to solve the following problem for conical flow. One is given 1) all the stage parameters on one of the radii, 2) the angles Θ (shape of flow lines in the axial plane shown in Fig.1) and the velocity on various radii before this stage (density of flow lines). It is required to determine changes across the radius of the flow angles in the peripheral plane and all the other stage parameters. The conditions of taper at sections 0—0, 1—1 and 2—2 can be expressed by the following equations:

Card 1/7

The design of stages with conical ...

$$\frac{c_{1a}\gamma_1}{c_{oa}\gamma_o} = \frac{r_o dr_o}{r_1 dr_1} = \frac{r_K + (a - B_c)\,\mathrm{tg}\,\theta}{r_K + a\,\mathrm{tg}\,\theta}\;\frac{a - B_c}{a} \qquad (1)$$

$$\frac{c_{2a}\gamma_2}{c_{oa}\gamma_o} = \frac{r_o dr_o}{r_2 dr_2} = \frac{r_K + (a - B_c)\,\mathrm{tg}\,\theta}{r_K + (a + B_{\pi})\,\mathrm{tg}\,\theta}\;\frac{a - B_c}{a + B_{\pi}} \qquad (2)$$

The notation used is given in Fig.1, and in addition 0 denotes the section at inlet to the nozzle; 1 - the section at discharge from the nozzle; 2 - the section at discharge from the runner blades; k - the blade root; cp - the mean radius; B - the blade tip; u - the projection on the peripheral direction; r - the projection on the radial direction; a - the projection on the axial direction; p - the annular current flow at inlet to the section under consideration (B_c and B_{π} in Fig.1). The article considers the flow at certain typical sections, making the usual assumption that if conditions (1) and (2) are fulfilled the flow will be conical or nearly so in the ducts between blades.

Card 2/7

The equation of radial equilibrium is first formulated and is used to derive the following equation for the angle α_1 of discharge of flow from the nozzle:

$$tg^2 \alpha_1 = r^{2n} \cos^2 \theta \left[(1 + tg^2 \alpha_1 \cos^{-2} \theta)_p + \frac{\varphi^2 \Pi}{n} (r_1^{-2n} - 1) + \right.$$
$$\left. + \frac{c_0^2 - c_{0p}^2}{c_{1\,up}^2} - r_1^{-2n} \right] \qquad (11)$$

In this equation there are two unknowns, tan α_1 and n, and the following expression is then derived for n:

$$n = \frac{tg^2 \alpha_{1p}}{\cos^2 \theta_p} \frac{1}{1 - r_1^{-2}} \left(\frac{j_0^2 r_0^2}{j_{0p}^2 r_{0p}^2 r_1} - 1 \right) - \frac{tg^2 \alpha_{1p}}{\cos^2 \theta_p} \cdot \frac{j_0^2 r_0^2}{j_{0p}^2 r_{0p}^2} \times$$
$$\times \frac{1}{r_1^2} \cdot \frac{j_{1\,up}^2}{1 - \frac{k-1}{2} j_{1p}^2} \cdot \frac{k}{\chi} - \frac{j_0^2 - j_{0p}^2}{j_{1\,up}^2} \frac{1}{1 - r_1^{-2}} + \varphi^2 \Pi \qquad (23)$$

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The design of stages with conical ....

In this equation j has the following meaning:

$$j = \frac{c}{\sqrt{kg\,RT^{\circ}_{0p}}} \qquad (22)$$

By means of equations (11) and (23) it is possible, by proceeding from one section to another, rapidly to determine the flow structure in the gap between the nozzles and runner blades. The following expression is then derived for the angle β_2 :

$$tg^{-2}\beta_2 = \frac{c_{0p}^2 \gamma_2^2}{c_0^2 \gamma_{2p}^2} \frac{r_2^2 r_{0p}^2}{r_{2p}^2 r_0^2} \frac{w_2^2}{w_{2p}^2} \frac{\cos^2\theta_p + tg^2\beta_{2p}}{tg^2\beta_{2p}} X \qquad (26)$$

$$X \frac{1}{\cos^2\theta} - \frac{1}{\cos^2\theta}$$

This article gives the equations only for the flow angles; the remaining parameters can be determined in the usual way.

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The design of stages with conical ...

The relationship between the angle θ (see Fig.1) and the radius with conical flow is given by the following expression:

$$\operatorname{tg}\theta = \frac{\operatorname{tg}\theta_B}{r_B - r_K}(r - r_K) = \varepsilon(r - r_K) \qquad (27)$$

To illustrate the influence of the degree of taper of the flow path on the change of the angle α_1 across the radius, calculations were made with various values of the coefficient ε. The initial data were as follows:

$\alpha_{1K} = 25^o$; $j_{1K} = 0.88$; $\theta_K = 0$; $c_0 = \text{const}$; $\frac{B_c}{r_K} = 0.23$;

$k = 1.34$; $\varphi_n^2 = 0.941 = \text{const}$. $(\chi = 1.315)$.

The results of the calculations are given in Fig.3a which shows the change in the angle of discharge from the nozzle across the radius with various degrees of taper ε. In curve 1 $\varepsilon = 0$; in curve 2 $\varepsilon = 0.394$; in curve 3 $\varepsilon = 0.849$; in curve 4 $\varepsilon = 1.47$. It will be seen that the cone angle has a very great influence on

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30285

The design of stages with conical ... S/096/61/000/012/002/003
E194/E155

the angle α_1. The reasons for this are discussed.
There are 4 figures and 8 references: 7 Soviet-bloc and the following English language reference:
Ref.2: Wu, A general theory of three-dimensional flow in subsonic and supersonic turbomachines of axial, radial and mixed-flow types. Trans. ASME, Vol.74, No.8, p.1363, 1952.

ASSOCIATION: Leningradskiy korablestroitel'nyy institut
(Leningrad Shipbuilding Institute)

Card 6/7

87503

S/124/60/000/012/006/009
A005/A001

24.2120

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 12, p. 80, # 15941

AUTHOR: Topunov, A.M.

TITLE: The Theory of a Turbine Stage With Long Blades at Variable Total Parameters Along the Radius in Front of the Stage

PERIODICAL: Tr. Leningr. korablestroit. in-ta, 1959 No.26, pp. 179-181

TEXT: The author considers the kinematics of the stream in acylindric turbine stage under the assumption of an insentropic process; the total parameters along the radius in front of the stage are variable. The relative heat drop in the stage, the vortex law, and the parameters at the average diameter are assumed to be known. Starting from the radial equilibrium equation the author determines the stream angles in the absolute and relative motion, as well as the statical pressure, the gas discharge, and the reactivity degree depending on the radius for a given law of variation in the total pressure along the radius in front of the stage.

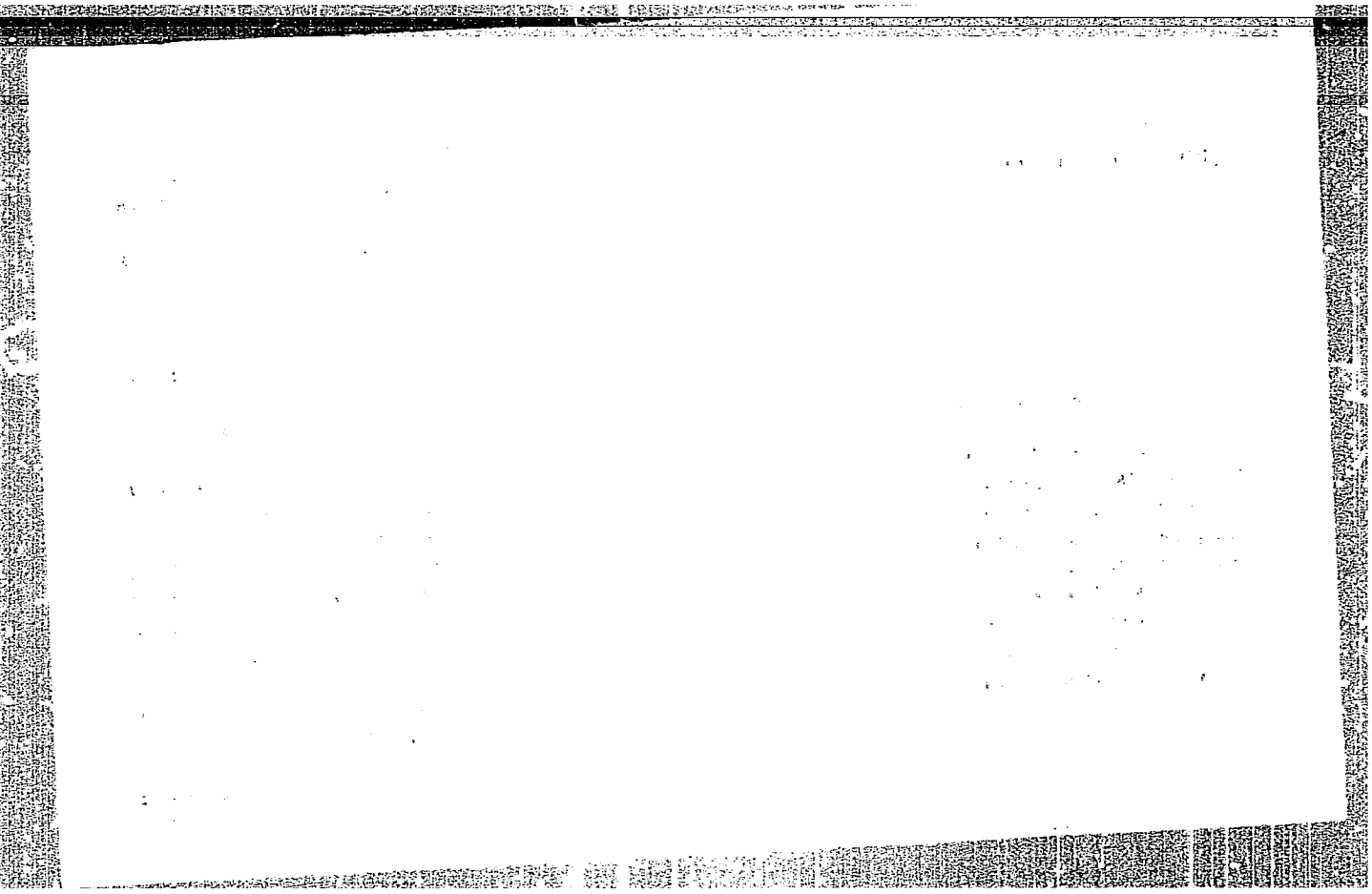
V.Kh. Abiants

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

ROZENBERG, Genrikh Sholomovich; MITROKHIN, V.T., kand. tekhn. nauk, retsenzent; MITYUSHKIN, Yu.I., kand. tekhn. nauk, retsenzent; TOPUNOV, A.M., kand. tekhn. nauk, retsenzent; SERDYUKOV, S.A., nauchn. red.; VASIL'YEVA, N.N., red.

[Marine centripetal gas turbines] Sudovye tsentrostremitel'nye gazovye turbiny. Leningrad, Sudostroenie, 1964. 256 p. (MIRA 18:2)



APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001756320003-4"

TOPUNOV, A.M., kand.tekhn.nauk

Generalized equation for summary flow through a nozzle row. Izv. vys.ucheb.zav.; energ. 3 no.4:71-81 Ap '60. (MIRA 13:6)

1. Leningradskiy korablestroitel'nyy institut. Predstavlena kafedroy sudovykh parovykh i gazovykh turbin.
(Steam turbines)

MOISEYEV, A.A., prof., doktor tekhn.nauk; TOPUNOV, A.M., aspirant

Experimental investigation of nozzle rims for stages having a constant degree of reaction. Izv.vys.ucheb.zav.; mashinostr. no.1:162-170 '59. (MIRA 13:3)

1. Leningradskiy korablestroitel'nyy institut.
(Air turbines--Testing)

TOPUNOV, A. M., Candidate Tech Sci (diss) -- "Some problems of gas dynamics connected with the stability conditions of the operation of the long blades of axial turbines". Leningrad, 1959. 26 pp (Leningrad Shipbuilding Inst), 150 copies (KL, No 24, 1959, 142)

TOPUNOV, A.M., inzh.

Selecting relative blade lengths for cylindrical turbine phases considering the strength conditions of their operation. (MIRA 12:9)
Sudostroenie 25 no.6:19-21 Je '59.
(Marine turbines)

TOPUNOV, A.M., inzh.

Improving operational stability of long turbine blades. (MIRA 12:1)
Sudostroenie 24 no.11:29-34 N '58.
(Turbines)

SOV/143-59-1-15/17

8(6)

AUTHOR: Topunov, A.M., Engineer

TITLE: On the Problem of Methods for the Testing of Profile Ring-Grids (K voprosu metodiki ispytaniy kol'tsevykh reshetok profiley)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Energetika, 1959, Nr 1, pp 116-122 (USSR)

ABSTRACT: Tests of profile ring-grids may play an important part in experimental gasodynamic research of long-bucket stages because they permit explanation of various aspects of the spatial flow in axial turbomachines. The length of the external check pipes is a factor that may bring about qualitative changes in the process of outflow from the ring grid and influence considerably the static radial pressure and other characteristics. If the length of the pipe is insufficient, the pressure drop at its outlet and the enlargement of the stagnation zone in the area of the hub reduce the radial gradient of the static pressure behind the grid, so the weight flow through the

On the Problems of Methods for the Testing of Profile Ring-Grids

grid increases. Such nature of the flow would make it difficult to find a method to elaborate a method for weighing reactive forces on the ring grid because a certain error would be introduced by the friction on the checking surface and by the eddies in the ring space behind the grid. The substitution of a partial admission for the full one has a similar influence on the quality of the flow as the shortening of the big upper pipe, i.e. the partial admission diminishes the radial gradient of the static pressure behind the grid and increases the weight flow through its working channels. This applies to the testing of long buckets in a long cylindrical pipe. In the cylindrical ring space behind the grid, a considerable diffusive effect can be obtained; as a result, a diffusion in the area of the bucket root will occur. This phenomenon should be taken into account in the design and when computing the power of the blowers. There are 8 diagrams and 4 references, 3 of which are Soviet and 1 German.

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SOV/143-59-1-15/17

On the Problems of Methods for the Testing of Profile Ring-Grids

ASSOCIATION: Leningradskiy korablestroitel'nyy institut (Leningrad Ship-Building Institute)

PRESENTED: By the Kafedra sudovykh, parovykh i gazovykh turbin (Chair of Marine, Steam and Gas Turbines)

SUBMITTED: July 4, 1958

Card 3/3

S/262/62/000/015/004/011
I007/I207

AUTHORS: Topunov, A. M. and Danilovskiy, A. G.

TITLE: The effect of M number on the applicability of the theory of cylindrical turbine stage

PERIODICAL: Referativnyy zhurnal, otde'lnyy vypusk. 42. Silovyye ustanovki, no. 15, 1962, 29, abstract 42.15.178 (Tr. Leningr. korablestroit. in-ta, no. 33, 1961, 81–92)

TEXT: The dependence of the limiting disc-hub ratio Rk_{max}/R_b on the Mach number is shown, and approximate equations are derived for determining the limiting disc-hub ratio and the total discharge through the nozzle ring.

[Abstracter's note: Complete translation.]

Card 1/1

S/124/62/000/009/010/026
A001/A101

26.2120

AUTHORS: Topunov, A. M., Danilovskiy, A. G.

TITLE: On effect of the M number on the applicability limit of the theory of cylindrical turbine stage

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 9, 1962, 36, abstract 9B232 ("Tr. Leningr. korablestroit. in-ta", 1961, no. 33, 81 - 92)

TEXT: The authors analyze gas discharge in the intercrown section of a turbine behind the nozzle guidance apparatus which produces vorticity of the flow at a constant angle α. They investigate theoretically the dependence of the discharge on the value of bushing ratio, angle α within the range from 10° to 90°, and Mach's number up to M = 4.5. An approximate formula for calculating discharge is proposed; it is stated that some "critical" bushing ratio exists below which the total discharge through the section drops with decreasing bushing ratio.

N. A. Kolokol'tsov

[Abstracter's note: Complete translation]

Card 1/1